Building Services Engineering

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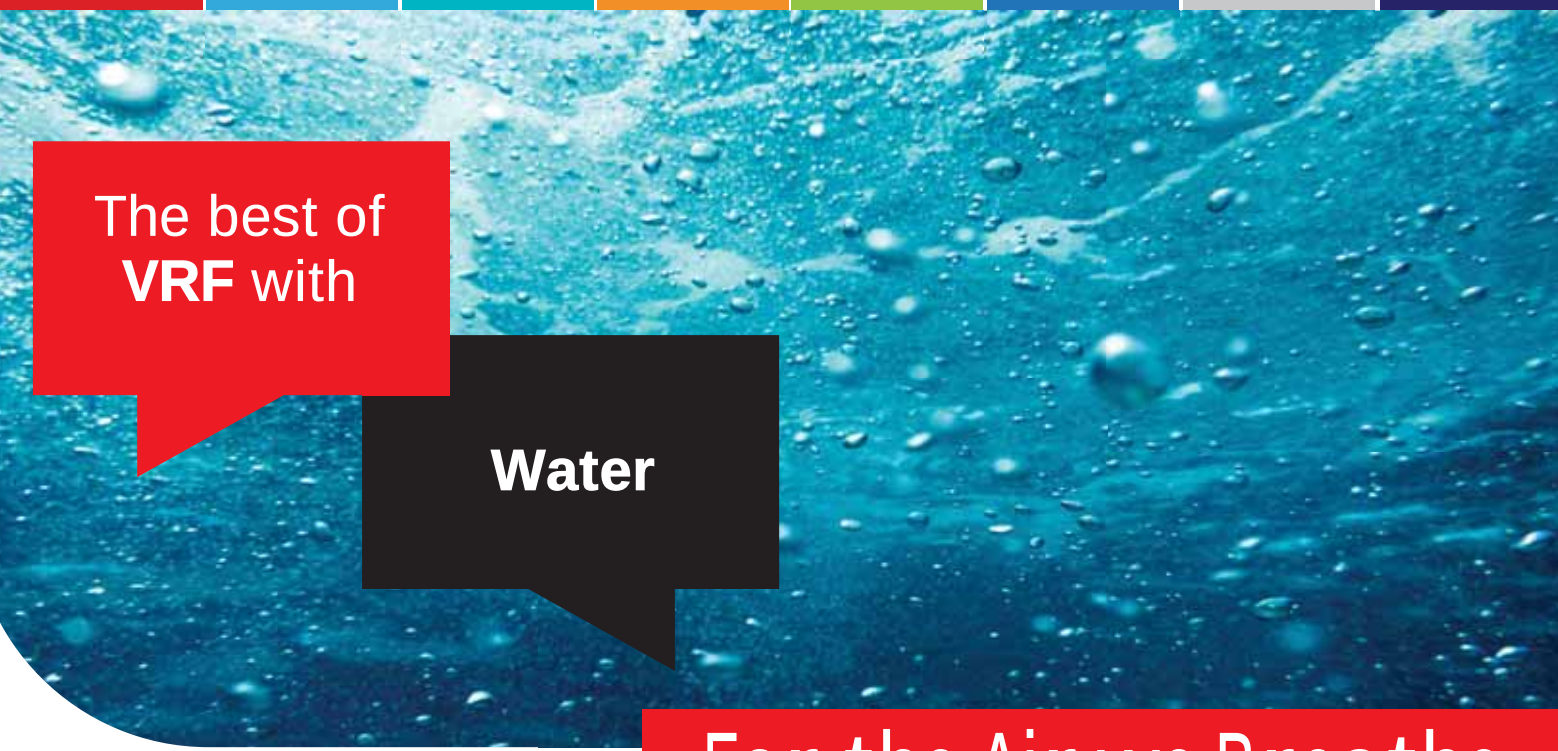
Changes for the Better

The future of Air is Water

Air Conditioning | Chillers | IT Cooling | Heating | Ventilation | Controls | Automation | Robotics



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Today's buildings face tough legislation which means that traditional HVAC technologies may not always be the best solution.

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40 YEARS IN IRELAND
1981 - 2021

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EDITORIAL

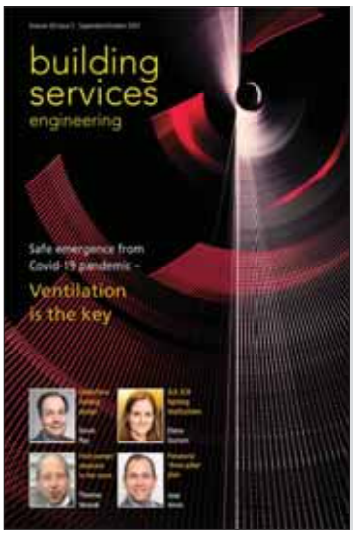
Skills shortage? … get in STEP now!

While everyone is acutely aware of the engineering skills shortage, not all industry sectors are doing as much as they could to alleviate it. Manufacturers and suppliers are very much to the fore with ongoing education/training programmes, plus considerable investment in purpose-built training centres.

Other sectors must also step up to the plate. An ideal way for consultants and contractors to do so is to participate in EI's *STEPS Engineering Your Future* programme. This involves an immersive work experience placement for transition year students to study engineering.

Research shows that 42% of students who took part in the 2017 programme are now studying an engineering course at third level, with a further 40% studying a STEM-related programme.

So, get in STEP with the programme now.



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Ventilation strategies must be realistic, user-friendly and appropriate for each individual project if they are to be effective in the fight against against Covid-19. If so, they will also aid in the battle against climate change, a true global crisis in itself.

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New climate legislative tools

The European Commission has adopted a new package of proposals to make the EU's climate, energy, land-use, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% before 2030, compared to 1990 levels.

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Elephant in the room

Thomas Nowak, Secretary General, EHPA, says that, instead of making the polluter pay for emissions by adding related cost to the price for fossil energy, most governments still support their use directly or indirectly, and leave the cost of environmental damage for society to pay.

NEWS AND PRODUCTS

Energy audit support scheme

The SEAI has introduced a new scheme to provide SMEs with a €2,000 voucher to cover the cost of an energy audit, and to determine if their business is suitable for renewable energy technologies.

Applicants must be registered and operate in Ireland, spend at least €10,000 per year on energy, have fewer than 250 employees and have an annual turnover of less than €50 million.

See also: https://www.seai.ie/business-and-public-sector/small-and-medium-business/energy-audits/

CJK acquires McGrattan & Kenny

CJK has acquired McGrattan & Kenny and will form a new mechanical and electrical engineering services group projected to have combined 2021 revenues of €45 million.

The formation of the new group will create an additional 100 jobs over three years, bringing the total complement to 360 people by 2024. The senior management teams in both companies remain unchanged and all employees are being retained.

CJK and McGrattan & Kenny have a long, shared history having worked successfully together on many projects. In addition to complementing one another on the mech/elec front, they also share similar cultures and core values, the most important being their belief that key to the continued success of any company is the personnel.

Eamon McGrattan, Managing Director of McGrattan & Kenny, said: "The creation of this new group will be very positive for the employees and customers alike. We are building on strong foundations forged through successful collaboration over the years, and I look forward to exciting times ahead."

Photo shows Eamon McGrattan, Managing Director, McGrattan & Kenny with Vinny Bruen, Managing Director, CJK.

Chris Satell joins Hevac

Chris Satell has been appointed Commercial, Industrial & Ventilation Manager at Hevac. He has more than 20 years' experience in the HVAC-R industry, beginning with a refrigeration engineering apprenticeship, and more recently completing a business management degree.

Over the years he has progressed through service and installation, to project/contract management and design and sales roles, working on pharmaceutical, food manufacturing, healthcare and data centre projects.

In his new role Chris will focus on supporting Hevac customers at design and tender stage across the full range of commercial and industrial boilers, heat pumps, AHUs, fan coils, chillers and air conditioning.

Contact: Chris Satell, Hevac. T: 086 - 102 1297;
E: chris.satell@hevac.ie

Apology to Bernice Reid, Hevac

Sincere apologies to Bernice Reid of Hevac. The gremlins were at work in the last issue of *Building Services Engineering* and we got Bernice's name wrong. So, see correct version of story below.

Bernice has realised a long-held career move in being appointed Internal Sales and Specifications Representative for Hevac. She studied economics at university and first entered the commercial heating industry in 2006.

Over the years she has gained considerable experience in the sector and is especially proficient in the application of radiators, radiant panels and trench heating for both domestic and commercial projects.

The bulk of her work is based on quoting specified projects. However, she will also support consultants and specifiers who require design assistance or help with product selection and heat loss calculations.

Contact: Bernice Reid, Hevac.
T: 01 – 419 1919;
E: bernice.reid@hevac.ie

Smarter hot water

Pinergy, the smart energy supplier, has entered a partnership with Climote that will see the Climote smart immersion controller made available as part of a 'Pinergy Lifestyle H2O' plan supporting the sustainable energy needs of families with smart meters.

The new Climote smart immersion controller replaces the traditional sink/bath switch with a more sophisticated wall-mounted controller that is linked to sensors placed on the water tank. It can be installed in less than 90 minutes.

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NEWS AND PRODUCTS

Enhanced BER Rating

SEAI has introduced an enhanced Building Energy Rating (BER) which will make it easier for homeowners to have a warmer, more comfortable home with lower energy bills. The new BER Advisory Report gives homeowners a personalised roadmap to bring their home up to an energy rating of B2 or better. It sets out the upgrades likely to have the biggest impact, with broad advice on likely costs.

SEAI advises homeowners that the BER Assessment must be carried out by an SEAI-registered BER Assessor. Each report will follow a simple three-step approach – address heat loss with insulation; improve energy efficiency of heating, lighting, ventilation; and add renewable technologies such as solar thermal or photovoltaic (PV).

William Walsh, CEO of SEAI (pictured), said: "SEAI also has a range of grants to help fund the cost of these home energy upgrades and works. In addition, there are a growing number of partners that will manage the entire upgrade process end-to-end, including the handling of the grant application for homeowners."

Cool podcast from Condair

Condair has produced a new podcast about how humidifiers can provide economic evaporative cooling in air handling units. In the 10-minute interview Dave Marshall-George, Sales Director at Condair, explains the different strategies available for using humidifiers for cooling in AHUs, as well as the opportunities and limitations each strategy presents. He also outlines a real-life case study.

The podcast can be listened to from Condair's website, Condair.co.uk, or can be found on Apple iTunes, Spotify, Soundcloud and Google Podcasts by searching for "Condair podcast".

Marshall-George will also present a CIBSE-approved webinar on the use of humidifiers for evaporative cooling in air handling units at 2pm on 29 September next. To register visit Condair.ie/webinars

NEWS AND PRODUCTS

Crawford Art Gallery redevelopment contracts awarded

The contract for the design of the redevelopment of the historic Crawford Art Gallery in Cork has been awarded to Grafton Architects.

The overall plan provides for the investment of some €29 million in the redevelopment of the site over the next four years and Grafton will be responsible for construction-related technical advice and design services to t he Crawford Art Gallery and the OPW, to whom ownership of the gallery was recently transferred.

PM Group appoints Jennings

PM Group has appointed Brendan Jennings, the former Chief Executive Officer of Deloitte Ireland, as Chairman.

He is a chartered accountant and has a Bachelor of Commerce degree from NUI Galway.

Welcoming his appointment, PM Group Chief Executive, Dave Murphy said: "Brendan has been working closely with PM Group since he was appointed to the Board in early 2020. His unique experience will be invaluable to us as we implement our new strategy and continue to grow our employee owned business internationally."

Jennings takes over from Dan Flinter who joined the Board of PM Group in 2004 and became Chairman in 2012.

Calpeda seeking Technical Sales Manager

Calpeda Ireland, the Dublin-based national distributor for the multinational Calpeda Spa, is looking to appoint a suitably-qualified person to fill the post of Technical Sales Manager. This is a newly-created position within the company and it offers great scope for advancement and development to the successful candidate.

An engineering degree or similar accredited technical qualification is essential, while experience in the pump sector will also be an advantage. The post comes with a generous remuneration package and excellent working conditions.

Interested candidates should send full CV details to Graham Fay, Managing Director, Calpeda Ireland at E: graham@calpedaireland.com

NEWS AND PRODUCTS

Riello supports hydrogen initiative

Through its participation in the Hy4Heat programme, Riello is helping to assess the potential for, and implications of, using 100% hydrogen as a carbon-free alternative to natural gas. Independent testing by Enertek International Ltd indicates that Riello burners operate as reliably and efficiently with hydrogen as they do with natural gas, requiring only a change to the means of flame failure detection.

The Hy4Heat in the programme in the UK is sponsored by the Department for Business, Energy and Industrial Strategy (BEIS) and managed by ARUP+. It is divided into several work packages and Riello was asked to join a consortium and provide burners for Work Package 5, commercial appliances, which includes commercial air heaters and radiant heaters.

The burners supplied for the project were shown to provide comparable performance with hydrogen as with natural gas. Because there are no carbon oxidation ions produced in hydrogen combustion, the flame failure detection was changed from an ionisation probe to ultra-violet sensors, with a corresponding change to the burner control box.

Development of the original control box now allows direct connection of a UV sensor in place of a flame ionisation probe, further simplifying any modification requirements when exchanging between the two fuels.

The test programme has now reached the point where the appliances are being assessed for EC Type Approval by a notified body.

"A new publicly available specification (PAS4444) covering hydrogen appliance testing has been developed by BSi within the Hy4Heat programme so testing is based on this and existing natural gas standards," explained Riello Technical Director Bernard Dawson. "In fact, there are many factors that need be addressed if hydrogen is to replace natural gas, most of them outside our sphere of influence. So we are focusing on ensuring that safe, efficient combustion equipment is in place when the switch to hydrogen becomes reality," he concluded.

See also www.rielloburners.co.uk

Healy appointed S&P Ireland MD

Tristan Healy, who has served as a ventilation specialist with S&P Ireland for the past eight years, has now been appointed Managing Director of the company with immediate effect.

Healy has extensive experience in the ventilation sector and assumes his new role at a very challenging, though nonetheless exciting, time not just for S&P Ireland but for the ventilation sector as a whole.

With health, wellbeing and air quality gradually coming to the fore in recent years, its importance is now being prioritised as a consequence of Covid-19, and the urgent need to make buildings, especially commercial, public and industrial premises, safe for occupants.

"We were already in the process of unveiling a whole new ventilation portfolio of cutting-edge products and innovative solutions," says Healy, "so we are now very strongly placed to meet the market demand across everything from schools, libraries and other public buildings through to offices, industrial units and of course domestic dwellings.

"In recent times we have also added to the S&P Ireland team, and conducted a comprehensive upskilling and education/training programme, so are confident that we can support our extensive dealer and installer network in delivering tailored solutions to cover all applications."

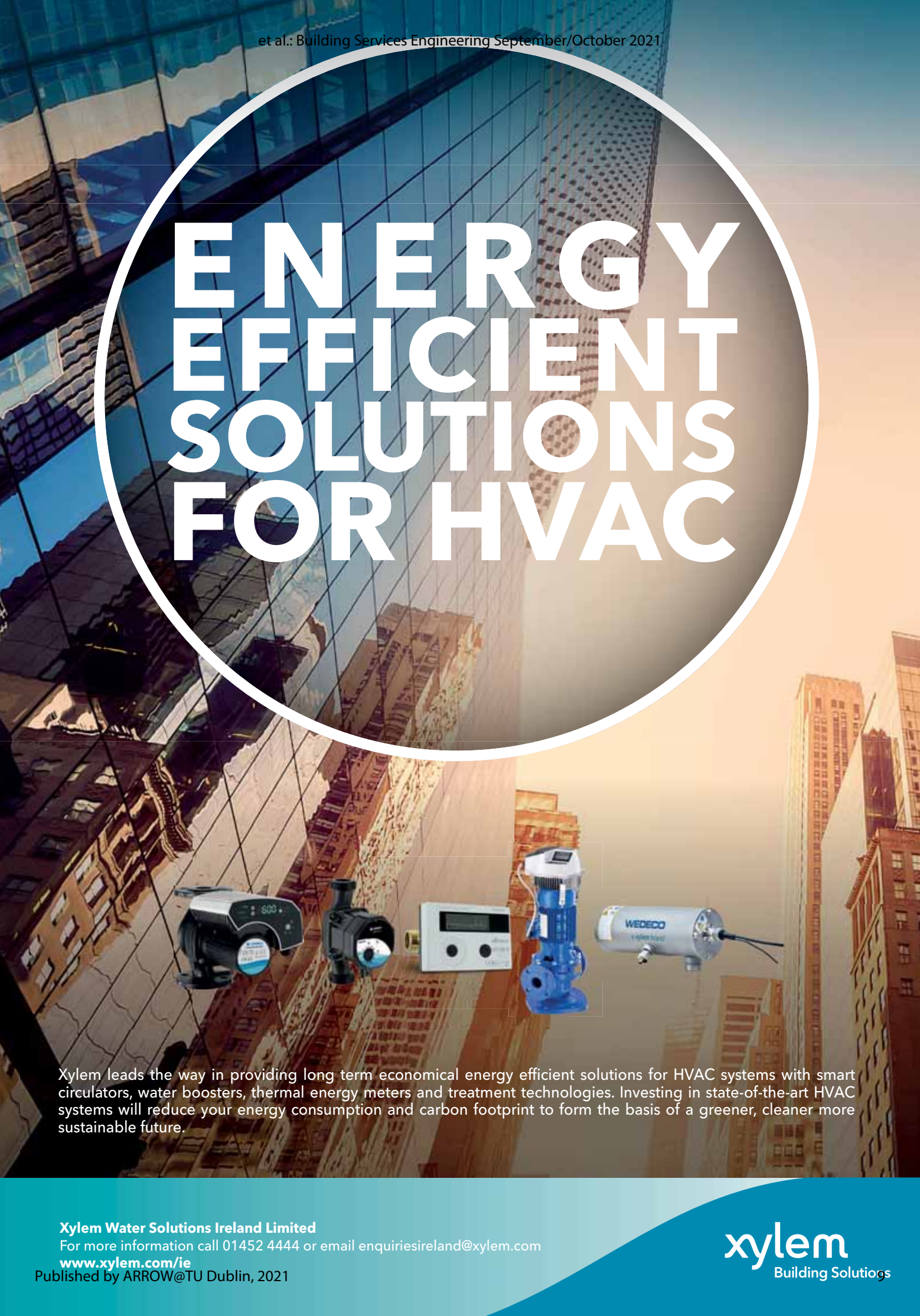
Davies host open days

To coincide with the easing of travel and mixing restrictions, Davies hosted a series of installer open days throughout August at its flagship premises in Raheny in Dublin.

On each of the different days the specially-erected marquee hosted one of its many leading-brand suppliers. Apart from product displays, personnel from these principals were also on hand to advise on product features and application benefits, and to engage on devising solutions for specific projects.

Chadwicks Group recently partnered with the Irish Wheelchair Association (IWA) to make essential accessibility improvements in the National Mobility Centre in Clane, including updating its kitchen and bathroom facilities. Pictured are Anthony Ridgeway, General Manager, the Panelling Centre with Joyce Greene of IWA Mobility Centre, Clane; Mick Monaghan, Chadwicks Naas Branch Manager; Pat Moore, Chadwicks Category Director; Renee O'Rourke of IWA Mobility Centre, Clane; and Niall McDonnell, IWA Mobility Centre, Clane (front).

ENERGY EFFICIENT SOLUTIONS FOR HVAC



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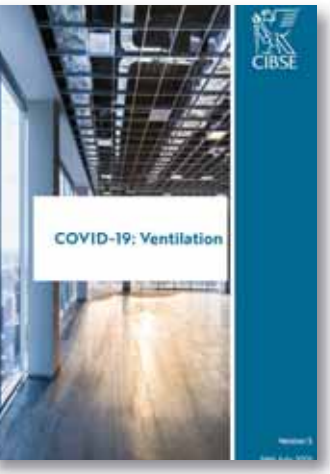
CIBSE Covid-related ventilation guides

CIBSE has published three new guides intended as an aid to all involved in the specification, design, installation and maintenance of ventilation systems for both new-build and retrofit applications. They specifically address Covid-related issues and are designed to satisfy the emerging ventilation challenges presented by the pandemic. They can be accessed at www.cibse.org

Ventilation guidance

This Covid-19 ventilation guidance is aimed at business owners, employers, building owners, managers, operators and those maintaining buildings.



It is intended to give business owners and managers an outline of ventilation systems commonly encountered in buildings and to advise on how they can be used, now and in the future, to maintain adequate air quality and reduce the risks of airborne infection.

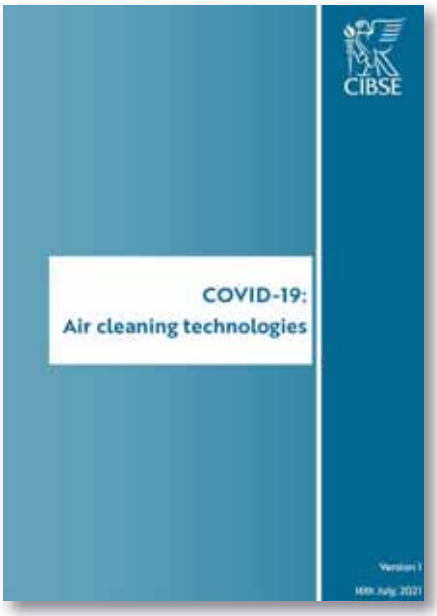
It can also assist building managers and those who operate and maintain building systems in identifying the areas of a building, and elements of ventilation systems, that may need particular attention in order to reduce risk to building occupants.

It is relevant to all types of building ventilation systems, whether natural, mechanical or full air conditioning.

Air cleaning technologies

Air cleaning technologies allow users to assess the variety of air cleaning devices currently marketed for the removal of SARS-CoV-2, and to discover which air cleaner, if any, will effectively reduce transmission risk in a given space.

This guidance document will be of use to those requiring a detailed background of air flow performance metrics, pollutant and viral decay, and tools assessing the performance of air cleaners in context.



Relative exposure index calculator

This relative exposure index calculator provides a method for the risk of airborne transmission of SARS-CoV-2.

A simple method is provided, allowing the user to describe the dimensions, breathing rate, respiratory activity, occupation duration and ventilation provision in a given space. It allows users to compare scenarios that involve air cleaners with those that do not.

A more complex calculation is also provided, allowing users to assess the impact of mitigation measures in reducing relative risk of secondary transmission.

If you wish to find out more information about these publications or any other CIBSE matters, send an email to CIBSEIrelandContact@gmail.com or visit cibseireland.org

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LIGHTING

The SLR, ELR and you

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LIGHTING ASSOCIATION IRELAND

What the lighting industry, and lighting solutions designers, need to know about the new EU Ecodesign and Energy Labelling Regulations.

In December 2019, and after nearly five years of negotiations, the European Commission published the Single Lighting Regulation (SLR) (i.e. Ecodesign Regulation for lighting) and the Energy Labelling Regulation (ELR). The SLR and the ELR will apply from 1 September 2021, except for the removal of labelling requirements for luminaires which already took effect on 25 December 2019. Both will have significant consequences for the lighting industry, *writes Elana Scaroni, Policy Director, LightingEurope (pictured).*

The SLR sets product-specific performance requirements for energy-using and energy-related products, whereas the ELR lists the labelling requirements for selling these products on the EU market. In February 2021 several additional requirements and corrections were introduced in both regulations: Regulation (EU) No 2021/341 amends the SLR and Regulation (EU) 2021/340 amends the ELR.

ELR applies to light sources only, while SLR applies to light sources and separate control gear, and luminaires (now generally identified as "containing" products) are only addressed indirectly. Nevertheless, luminaire manufacturers must review the rules and ensure their products comply with the new requirements.

LightingEurope has published three sets of guidelines – on the SLR, the ELR and on the EPREL obligations for light sources – to help companies understand and apply the new rules to their products. Members of LightingEurope and their member lighting associations benefit from free access to the guidelines; members of the Lighting Association of Ireland can contact the organisation to get their free access code.

Ecodesign – improving product performance

The Ecodesign Regulation (SLR) establishes EU-wide rules for improving the performance of light sources and separate control gear.

The SLR definition of a light source includes lamps, modules, and even some "containing" products. A containing product is defined as a

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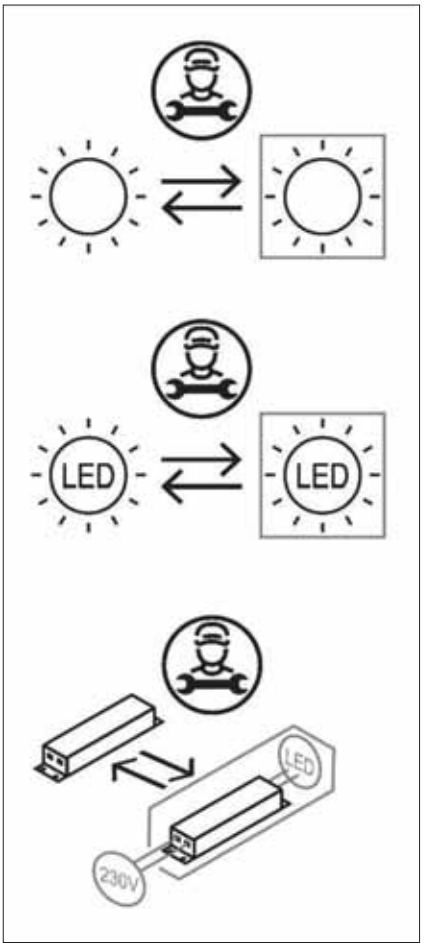
product containing one or more light source(s), or separate control gears, or both. This can include not only luminaires, but also light sources contained in household appliances or furniture. The supplier of a containing product must ensure that the light source and separate control gear used in the containing product complies with all relevant EU legislation, including the SLR and the ELR.

The SLR sets minimum mandatory requirements for energy efficiency, and any product that fails to meet these requirements will be phased out on 1 September 2021, starting with products like CFLi lamps and halogen R7s > 2700 lm lamps. As a result of this phase-out, these light sources will need to be replaced with new energy-efficient light sources and lighting installations will have to be renovated.



Placing these pictograms on the packaging can cover the information requirements on the replaceability of light sources and control gear by end-users or qualified persons. From top: Replaceable light source by a professional; Replaceable (LED only) light source by a professional; Replaceable control gear by a professional.

• Connected light source (CLS):	[yes/no]	Refer to Definition 6 of Annex 1 in Reg.2019/2015
• Colour-tuneable light source:	[yes/no]	Refer to Definition 8 of Annex 1 in Reg.2019/2015
• Envelope:	[no/second/ non-clear/ second & non-clear]	Refer to Definitions 36 and 37 of Annex 1 in Reg.2019/2015. Only applicable for HD light sources. Please note that the option "second and non-clear" is added at a later stage and available only in EPREL.

Details on the values to be uploaded to the ERPEL database.

SLR and the circular economy

The SLR introduces several new elements that are related to the circular economy. For example, all manufacturers, importers and authorised representatives of containing products must ensure that light sources and separate control gears can be easily replaced using commonly-available tools and without permanently damaging the containing product.

They also need to ensure that light sources and separate control gears can be removed without being permanently damaged for verification purposes by market surveillance authorities. If the light sources cannot be removed for verification without damaging one or more of them, then the whole containing product must be tested as a light source and must comply with the requirements for light sources set out in the SLR and the ELR.

The SLR requires that manufacturers, importers and the authorised representatives of containing products provide information about the replaceability or non-replaceability of light sources and control gears by end-users or qualified persons.

LightingEurope has developed pictograms with the required information on replaceability/ non-replaceability. They are freely available on the LightingEurope website for all companies to download and use.

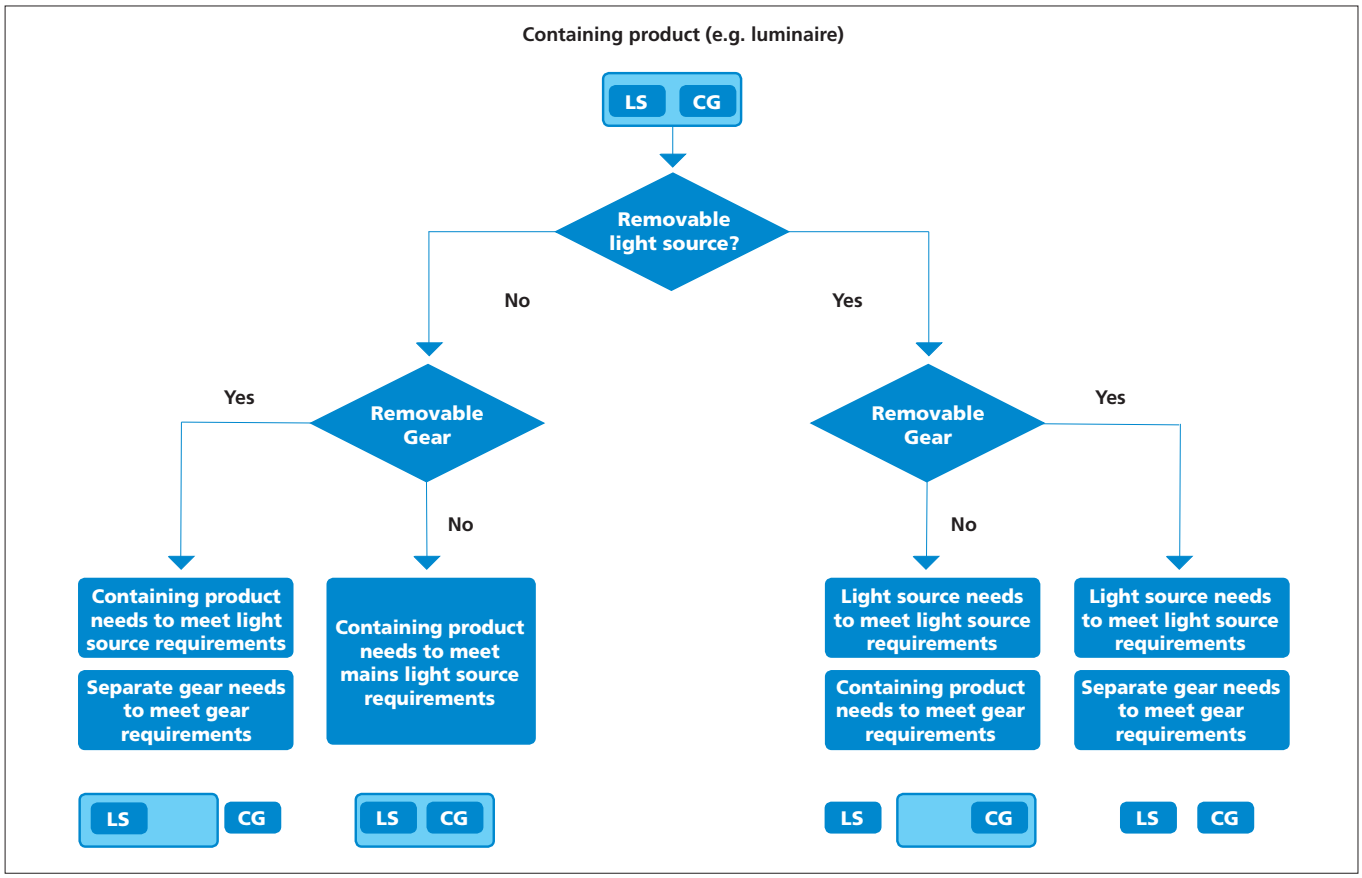
ELR – empowerment through Information

The ELR addresses light sources that are defined in the SLR to include lamps, modules and even some containing products – please note that since 25 December 2019 there is no energy label requirement for luminaires.

The Regulation requires that specific product information be provided via an energy label that includes the rescaled energy classes: the new classes are set from A (most efficient) to G (least efficient) and will gradually replace the current system of A+++ to G energy labels. It also requires that the manufacturer provides information on the product's class, along with other relevant technical information.

As the Regulation applies to the entire supply chain, there are varying requirements for what information must be provided, and by whom.

Suppliers such as manufacturers, authorised representatives, and importers must, for example, place an energy label on the packaging of all independently packaged light sources.



Compliance of luminaires, light sources and control gear on removability.

Dealers for example, on the other hand, are subject to a separate set of requirements. For instance, adverts promoting a product must include not only that product's energy efficiency class, but also the range of energy efficiency classes listed on the label.

Given the large number of light sources with the old label that are already at points of sale, the law has delayed the deadline for relabelling to 1 March 2023. This 18-month timeline allows retailers to sell products with the old label until that date.

The recent amendment to the ELR (by EU Regulation 2021/340) has introduced a bit more flexibility for manufacturers of new models of light sources: it allows them to rescale the label in advance of the 1 September 2021 deadline, if they so wish. These products can also be registered on the EPREL database with a date of placement on the market starting from 1 July 2021, but the dealer cannot offer those light sources for sale before 1 September 2021.

EPREL obligations for light sources

The ELR also requires that all the information included on a product's energy label, in its product information sheet and its technical documentation, has to be entered into the European Product Database for Energy Labelling (EPREL) before the product can be placed on the EU market.

The European Product Database for Energy Labelling (EPREL) is the common database for information on the energy labelling of products sold in the EU, including lighting. The database consists of a public part accessible to all consumers, and a compliance part accessible only to Member State market surveillance authorities and the European Commission.

The LightingEurope guidelines on the EPREL database explain who in the supply chain needs to upload what information to the EPREL database and by when, including:

- A clarification of the scope of the EPREL database, including when it is necessary to register containing products to be tested as a light source;
- The values to be uploaded to each part of the EPREL database with a detailed explanation for each value;
- A non-exhaustive list of harmonised standards.

The EPREL guidelines also include an excel template to help companies upload information directly to the compliance part of the database.

The voice of the lighting Industry

As the voice of the lighting industry, LightingEurope is dedicated to helping companies understand and apply these complex new rules. The LightingEurope Guidelines on the SLR, the ELR and the EPREL database are available to download or order on the LightingEurope website.

To help you navigate regulatory changes and ensure you have the information you need to make informed lighting design and investment decisions, visit: www.lightingeurope.org ■

DIGITALISATION – PART 3

Digital transformations

Author: Paul McCormack,
Belfast Metropolitan College Innovation Manager

This is the third article in the series of six, detailing the advantages of digitalisation for the built environment and why companies must engage in the process to secure sustainable growth and success.

This final piece in Part 1 of the series, "The Tools", builds on the previous digitalisation and BIM articles*. Digital Transformations will detail the pathway that companies must define, detail and develop for their own particular needs.

If industry is to develop and leverage its digital skills for energy efficient construction, and increase its competitiveness, it will be driven via the skills of the workforce. Upskilling must be demand-driven, demand both from the industry perspective and from the workers in the industry. It is this "meeting of demands" that will lead to success in meeting the needs of industry, society and the environment.

Introduction

Digital transformation is a topical subject for all of industry and is seen as a key organisational strategy to support sustainable growth, especially in industries such as construction which is seen as a technology laggard. BIM is recognised as one of the main digital tools that are critical enablers that can embed digital processes within organisations. Specifically, the information management processes within BIM help companies in transforming traditional information processes and turning the information into data that is easier handled, used and analysed.

Digitalisation or digital transformation is the process of integrating digital technology into all facets of business operations. For the construction sector that means implementing digital tools and technology to capture data at every step in the construction process, and "translating" this data to make informed decisions delivering a more efficient, productive and safer built environment.

Disruption

Our world has fundamentally changed, especially from a business perspective. In reality, all businesses must fundamentally change if they are to survive and prosper. The construction sector has simply survived over the years by evolving. However, in today's world this is no longer sufficient.

Challenges

Europe faces many challenges in the decade of the 2020s, especially reducing C02 emissions. In order to tackle the climate crisis we must address the issues at root level by developing a skilled workforce, equipped with the tools to meet the challenge head on.

This challenge provides the built environment with an opportunity to both transform and increase its competitiveness. If the built environment is to deliver sustainable construction with a zero-carbon footprint it must transform its business practices, supply chains and operations. This can be achieved via a digitally-equipped workforce.

The green economy is an instrumental part of sustainable development and Covid economic recovery plans across the globe. The mainstay of the green economy is to deliver a better-skilled workforce and to reduce labour market shortages by increasing participation in training. This, in turn, will result in increased incomes for individuals, increased competitiveness for the construction sector due to a better skilled workforce, and the capability to deliver a greener built environment.

Transformation

Digital transformation in the construction industry has been slow to date. This failure to adopt digital technology is perhaps based in the sector's systemic resistance to change and hesitancy to innovate. The construction sector is still a "traditional" industry with many construction projects still paper-based, creating a disconnect between the site and office.

In order to overcome the barriers to achieving digital transformation, construction professionals across the entire spectrum need to align on process and technology tools, and to learn new technical skills. By embracing the digital transformation construction companies can become more agile, streamlined, communicate easier internally and with their subcontractors, collaborate more widely, reduce construction time, improve efficiencies and become more competitive.

By engaging in digitalisation and

transforming from paper to online, real-time sharing of information, the industry will ensure transparency and collaboration, timely progress and risk assessment, quality control and, eventually, better and more reliable outcomes.

Construction companies must empower their staff so they can design a Digital Transformation Roadmap for their operation, stimulating demand for sustainable energy skills. This roadmap or framework will enable BIM to be utilised as a tool to aid in the development of company-specific digital transformation processes. It will result in a digital workforce staffed with people who are digitally aware and enabled to use the digital tools such as BIM as an everyday part of their work, building a culture within the construction sector that is digital-ready.

Digitalisation

Transforming the EU construction sector to be greener, consume less energy and reduce the carbon footprint of the sector will be driven as much by the growing market for digitalisation and data, as by legislated carbon reduction targets.

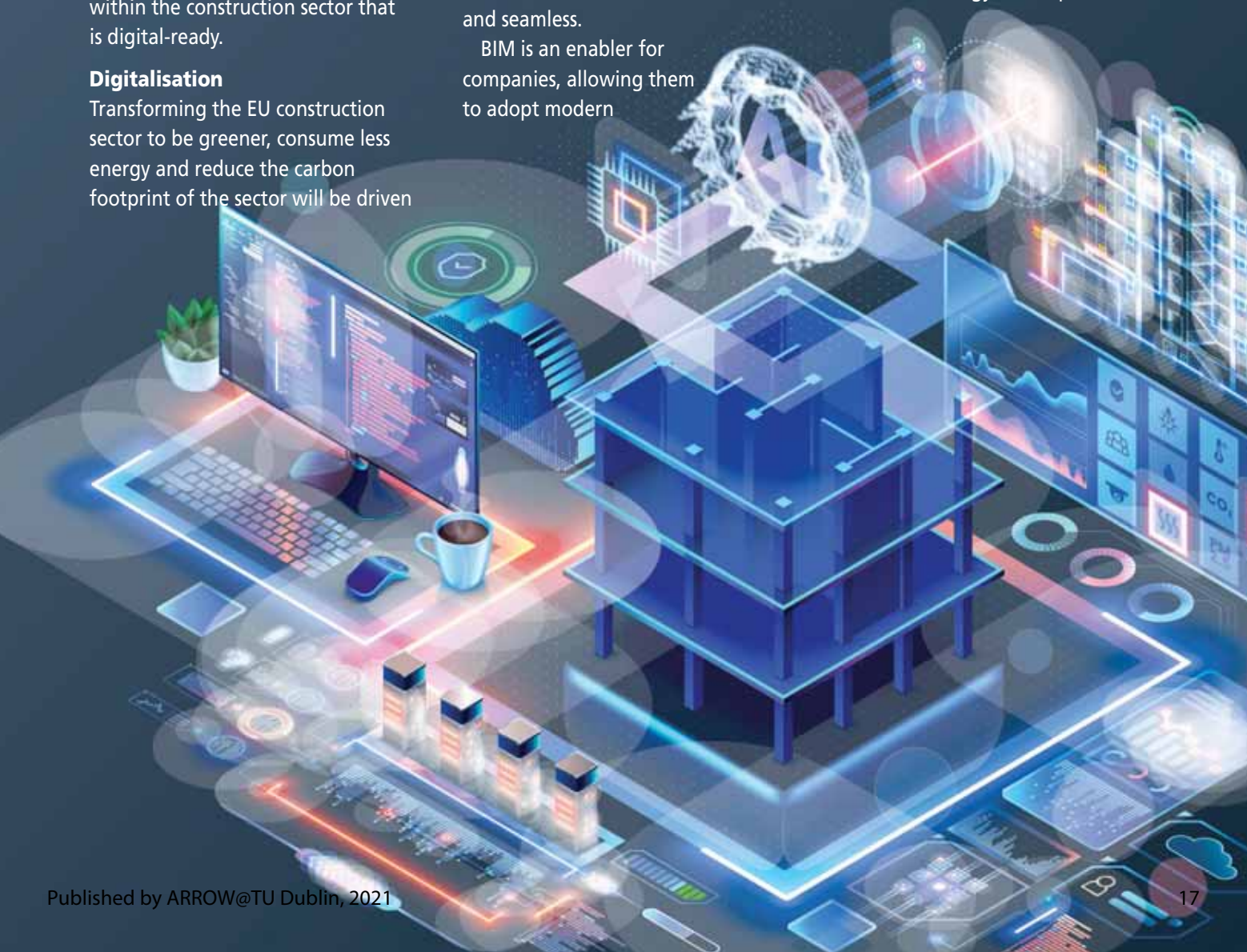
BIM as an enabler

The construction industry's digital journey covers many digital components including apps, AI, IoT and other bespoke software. These digital tools are all part of the digital toolbox and are becoming increasingly important as the industry transforms. With international collaboration, industry partnerships, larger international projects, and complex processes, the complexity of projects and tasks are made easier with the aid of technology – a common language all can share. With digital solutions, risks are being avoided and mitigated and, what were once arduous programmes of work, are now far more efficient and seamless.

BIM is an enabler for companies, allowing them to adopt modern technologies. It is a critical tool that will keep them innovative, competitive and agile. BIM is the technology that is making the most transformative difference in the industry and is the first common language that the industry can collaborate and co-ordinate with, creating a shared data platform, essential to informing the decision-making process across the entire construction value chain

Decarbonising construction

Governments, particularly in the EU, are increasing their CO2 and energy efficiency regulations and raising their targets, following the EU strategies and policies for decarbonisation of the construction sector and approaching NZEBs. Digitaltalisation – going hand-in-hand with energy skills – provides



a great opportunity to reduce the environmental impact of construction projects.

The construction sector is increasingly struggling with how to gather data in a co-ordinated fashion across the entire supply chain. It has the information but it is "hidden" in paper copy. The sector must digitalise this data in order to use it in a proactive analysis to reduce costs, increase competitiveness, shorten build times and plan, develop and deliver sustainable energy construction. By utilising BIM to gather data, the sector can then organise, store and extract value from the data. This will lead to greener construction and enable net zero carbon footprints in construction. BIM is a repository of energy information of buildings, accessible and usable by all stake-holders in a systemic and coordinated environment.

Training

Educating and training the construction workforce in digital skills will stimulate demand from within and help develop and implement a digital transformation skills roadmap for companies. Both public and private owners would be involved in the definition of the roadmaps as they are the pullers of the innovation. This education process will stimulate demand by enabling participants to share and amplify content online, allowing them to collaborate digitally and to become impulsive about their sustainable energy skills.

How to truly get digital

The first European call for BUILD UP Skills (BUS) proposals took place in 2011 when the digitalisation of the building process, and the implication for the supply chain of the building sector, was not yet "known" in most European countries. The first European directive to name the digitalisation of the building sector, in fact, was the Directive 2014/24/EU on Public Procurement. BIM is the first truly global digital construction technology and it is being deployed in every country in the world. It is vital that all the construction sector, especially SMEs, participate fully in this digital transition. Digital tools such as BIM play a central role within the digital transformation of the building sector and must be integrated into company primary processes for it to be sustainable and deliver benefit.

> BIM is a critical tool and the enabler to allow companies adopt to modern technologies and remain innovative, competitive and agile.

Digitalisation projects such as BIMcert and ARISE are steps in place to support and empower the construction sector to begin and sustain its digital transformation journey. They are specifically designed to stimulate and inspire the demand for sustainable energy skills from industry and individuals by redesigning the skills exchange, providing clear upskilling transactions and recognition of upskilling performed.

ARISE will deliver a "portable" skills mechanism that provides the learner with flexibility of access and vocational mobility, while also enabling industry to "capture" the expertise within the workforce to deliver efficiency, effectiveness and environmental advancement in the sector. The ARISE digital Individual Learning Account (ILA) will pave the way for the transition from paper-based to digital credentials in the European skills area, developing and delivering digital credentialing solutions, using Blockchain technology for verifiable transactions.

Conclusion

It is recognised that the construction sector has traditionally been slow to adopt change, but this has improved in recent years. Construction companies are now responding to the external environment and recognising that digital transformation is key for the sector to grow, develop and innovate. Key decision-makers are realising that technological change and adaption is inevitable. We are witnessing more and more companies embracing digital transformation, streamlining business operations, coordinating their staff resources and significantly reducing energy consumption across the entire build cycle.

However, digital transformation is not a quick-fix but a continual, incremental, ever-evolving process delivering sustained change and benefit. Construction organisations have to recognise the many benefits, understand what digital transformation actually is, develop their own digital transformation roadmaps, and secure commercial benefit and growth from it.

That said, there is no "one-size-fits-all" approach and there are different solutions for different business needs across the construction supply chain. Also, given the variety of technologies and the number of vendors to choose from, knowing where to start can be a real challenge. So, start by looking internally, develop the skills within your team and map out your own transformation route.

Digital transformation is now recognised as a smart investment that is delivering commercial, environmental and social returns for the industry. It is the dawn of a new era for the construction sector. ■

***Part 2: Pathway – navigation**, will comprise a further three articles on:

- The need for upskilling within the industry;
- The benefits of a digitally-informed and empowered workforce;
- Stimulating the demand for skills.

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THE INTERVIEW

José Alves, Panasonic Heating & Cooling Solutions Europe

'Three pillar' Panasonic commitment to Ireland

Panasonic already has a very strong market presence in Ireland, built initially on the excellence of its air conditioning products and, more recently, on the strength of its innovative heating portfolio. Now, that presence is set to extend further with the timely introduction of its cutting-edge, CO2-based, commercial refrigeration solutions.

Just recently José Alves, Country Manager, UK, Republic of Ireland and the Netherlands, Panasonic Heating & Cooling Solutions Europe, visited Ireland to announce details of a major development strategy designed to reinforce this presence, and to expand its penetration across all three market segments. He spent over a week visiting customers throughout the country in the company of Vincent Mahony, National Account Manager, Panasonic Ireland, and *Building Services Engineering* caught up with them both as they concluded their travels.

It was obvious from the outset of our conversation that José Alves came to Ireland not just to present Panasonic's vision but also to listen to, and learn from, its extensive customer and dealer network. It was equally obvious that he was enthused by what he had experienced, and comforted that Panasonic's renewed commitment to Ireland was well justified.

"We've always enjoyed considerable success in Ireland," said Alves, "and further to my visit, I'm 100% confident that our new development plan – based on the three pillar strategy of air conditioning, heating and refrigeration – is perfectly timed. While each of these market segments has its own particular needs, common to all is the requirements for high-performing, energy-efficient products that deliver sustainable, regulation-compliant solutions. We've now developed highly-innovative technologies to achieve these goals and these are now

Right: José Alves, Country Manager, UK, Republic of Ireland and the Netherlands, Panasonic Heating & Cooling Solutions Europe.

incorporated into the entire Panasonic portfolio.

"This creative thinking is perhaps best illustrated by our recent entré into the commercial refrigeration sector. The global transition to climate-friendly HFC-free technologies has been an industry priority for many years now. Driven by environmental concerns, legislation such as the EU F-Gas Regulations now require increased adoption of 'alternative' refrigerants, such as CO2, with its zero 0DP and GWP of 1.

"Thus, the development of Panasonic's CR Series of CO2 condensing units which deliver reliable and sustainable refrigeration that is safe, efficient and uses patent-free available refrigerant. While relatively new to Ireland, this technology has been widely used, and proven, over the last decade in Japan. It is ideal for commercial applications such as supermarkets, petrol-stations, cafeterias, hotel and restaurant cold rooms, and industrial processes such as food and medical. Compared to other natural gases, CO2 is neither toxic nor flammable, while benefits include energy savings, low noise levels, light weight, low refrigerant charge, low installation cost and low costs on servicing.

"Turning to air conditioning, one of our most significant recent introductions is the incorporation of naneo™X technology into our consumer, small business and commercial portfolio. These units already featured energy and sustainable features but, with the impact of Covid, health and wellbeing is now very much to the fore. Thanks to our unique naneo™X technology, we now offer air conditioning solutions that also inhibit certain bacteria, viruses, pollens, allergens and moulds, as well as breaking down hazardous substances.

"Similarly, when it comes to heat pumps, Panasonic is now one of the leading suppliers of energy efficient, sustainable heating solutions for both domestic and commercial

Vincent Mahony, Ireland National Manager, Panasonic Heating & Cooling Solutions Europe with Des O'Brien, Technical Projects Engineer, pictured at the new Panasonic Ireland headquarters and showrooms in Dublin 22.

applications. We cater for all project types, both new-build and retrofit, and work closely with both system designers and installers to devise tailored solutions where applicable. Apart from the performance, energy and sustainable benefits, our air to water and air to air heat pumps also come with sophisticated control options for the end-user.

"For installers, we also have Aquarea Service Cloud which allows remote access to customers' heating systems. This increases customer satisfaction by reducing response times and also saves time and money."

That said, the product portfolio and system solutions offered by Panasonic are but part of the picture. Equally important is the proactive engagement with its dealer network by way of design advice, technical support and training. To that end Panasonic Ireland has recently completed the refurbishment of its dedicated Training Centre at its Dublin headquarters. This is a state-of-the-art facility with fully functioning displays that allow for hands-on experience to complement the technical/academic modules of the various training programmes. These CIBSE-accredited CPD courses are also delivered online where personal attendance is not possible.

"We are encouraged by the way Ireland has embraced the sustainability objective," concluded Alves, "and are excited to be part of a process that will help the industry deliver zero energy and zero carbon solutions." ■

AIR CONDITIONING IRELAND LTD

Core Air Conditioning Ltd is the sole distributor for Carrier and Vertiv commercial and industrial chiller, HVAC and computer room products in Ireland. It provides a comprehensive package of air conditioning and process-related solutions across all application types and industry sectors.

Core combines this product portfolio with excellent technical support and a highly-qualified service team that, in addition to commissioning and trouble-shooting, also delivers a range of customised maintenance packages. These ensure the optimum performance of installed systems, prolong equipment lifespan, and prevent the consequences of system failure or total shut down.

Core's service agreements are highly-flexible and are specifically designed for each individual installation. After a thorough site survey, the right combination of options can be selected for the particular facility. In addition to service, repair and planned maintenance, diagnostic and proactive recommendations for improvement are also provided, in addition to emergency response. Core's team of service/maintenance engineers have wide-ranging experience across all HVAC equipment, covering all brands, and so offer all-embracing comprehensive solutions.

The key elements of the service selection process, and the actual service packages that result, are detailed here.

Technical service and planned maintenance

› Planned Maintenance

Core's planned maintenance service is the ultimate in long-term preventive maintenance. It includes the necessary multi-year preventive maintenance items that are performed at intervals greater than one year, in addition to the annual and recurring items such as every three, five or 10 years. Major disassembly to repair, or replace, internal parts and rotating assemblies as a result of normal wear can be included.

› F-Gas Inspection

Under the European Fluorinated Gases Regulations (EU517/2014), Core Air Conditioning Ireland can carry out inspections on all equipment, irrespective of brand, to ensure regulatory compliance. All engineers are F-Gas approved and qualified to carry out leak checks and issue the proper paperwork confirming obligations have been met under EU 517/2014.

› Repair Service

Under the European Fluorinated Gases Regulations (EU517/2014), Core Repair service may consist of a service order to repair or replace a component. It can include equipment overhaul, rebuilding, non-destructive testing or analysis of fluids and tubes. Various repair services can be stand-alone or combined with any of Core's other services.

› Full Preventive Maintenance

This includes all the inspection maintenance services, plus pre-scheduled recurring annual tasks which may require disassembly for preventive maintenance, as part of Core's major maintenance service. Minor repairs, motor testing and leak testing are also carried out.

Core Air Conditioning Ireland Ltd
Unit A6, Centrepoint Business Park,
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Tel: 01- 409 8912
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The Core Service and Maintenance team – John Murphy, Service Manager with Jennifer Courtney, Service Coordinator and Fintan Brewster, Technical Manager.

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Service

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Non-destructive Testing

- Oil and water analysis
- Motor insulation testing
- Thermographic testing
- Ethylene and propylene glycol

Monitoring Service

With chillers, a problem is not always present when an engineer is on site. Core offers a unique service on Carrier equipment called PC Data Collection Tool (PCDCT). With PCDCT, the Carrier chiller is monitored for 24-hours or more, and all parameters are recorded at 2-second intervals. Technicians at Core and Carrier then study this and recommend any changes to improve the operating efficiency of the system. It can also indicate problems that may arise before they lead to catastrophic failure. The customer is then left with a blueprint of the operation of the machine.

Inspection Maintenance

Inspection, logging and adjustments of equipment are part of Core's basic minor maintenance service. This service may require minimal disassembly such as oil and filter changes and includes a report, complete with service recommendations. On Carrier and Vertiv equipment, this also includes any software upgrades recommended by the manufacturers.

Predictive Maintenance

This non-destructive testing service covers oil analysis, water system analysis, alignment checks and calibrations that may be combined with the minor or major maintenance. This can help prevent chiller failure and help eliminate equipment downtime. Because oil analysis can identify the wear-and-tear of a chiller, if conducted on a scheduled basis it ensures the chiller delivers reliable performance for years.

Invaluable Database Record

Core maintains a complete database of all tests, and results, performed on a system and equipment. This provides invaluable information to to help performance, and also helps identify possible future problems. It is a key component of predictive maintenance.

Emergency Service

Because Carrier and Vertiv units – and other leading brands of equipment – serve critical systems where downtime is an expense as well as an inconvenience, Core offers a 24-hour emergency service on all of its maintenance contracts. Average response time from call receipt is two hours for the Dublin and Cork areas and under four hours nationwide. Core engineers carry stocks of the most commonly-used parts but also have 24-hour access to express parts delivery for less common items. Repairs are completed day or night, to return equipment to normal operating condition as quickly as possible.

Motor Insulation Testing

Motor failures are usually caused by motor winding breakdown, so Core engineers conduct regular motor insulation testing. This identifies insulation deterioration before failure occurs, and so allows for planned budgeted repair. Meg-ohm testing is used to identify weak spots in motor windings or the presence of potentially-damaging moisture. It also avoids labour-intensive disassembly.

thermeco$_2$ key to sustainable heating and cooling

Today, sustainability is no longer an idea but rather a concrete goal, and one that is now close to being realised thanks to pioneering work by leading manufacturers such as Engie Refrigeration. Its latest introduction, the highly-innovative *thermeco*$_2$ series, is now available from Sirus. It comprises a range of high-temperature heat pumps that work exclusively on environmentally-friendly refrigerant CO_2 (R-744). They provide hot water temperatures of up to 110°C and simultaneously provide cooling temperatures down to -15°C. This minimises or eliminates the need for boilers and chillers, depending on the application.

The F-Gas Regulation serves to reduce direct emissions and prohibits refrigerants that are extremely harmful to the environment. It calls for a reduction in the emission of fluorinated greenhouse gases and, by 2030, the CO_2 equivalent will be reduced to approximately one fifth of the 2015 quantity. Above all, however, the availability of refrigerants in the market will become a central issue for the safe operation of heat pumps and chillers. Carbon dioxide, a natural refrigerant, provides operating companies of heat pumps and chillers with the opportunity to make future-proof investments, comply long-term with legal regulations, and to run systems in an energy-efficient manner.

thermeco$_2$ heat pumps and chillers are designed, manufactured and tested in Germany, specifically for the European market and in accordance with all applicable EU directives. Where necessary, design reviews have been carried out by TÜV Süd. Functional safety and reliability are a top priority.

Tried and tested technology is used in the semi-hermetic reciprocating compressors and heat exchangers. Frequency converters make capacity control more precise. The oil separators and oil collectors were developed specifically for CO_2 applications.

Benefits of CO_2 heat pumps and CO_2 chillers

- Carbon dioxide is a natural, environmentally-friendly alternative to traditional refrigerants;
- Effective refrigeration with simultaneous heat production to a high-temperature level;
- Effective heat recovery using industrial waste heat sources and wastewater;
- Reduction of CO_2 pollutant emissions through oil and gas savings;
- No exhaust fumes, particulate emissions or appreciable heat losses;
- Highly cost-effective, short payback period;
- Premium quality, designed and produced in Germany in line with ISO 9001;
- Plant-side quality inspections are certified;
- State-of-the-art control technology including remote monitoring;
- Compact design.

The high temperature *thermeco*$_2$ water-to-water CO_2 heat pump series is particularly suited to industrial applications, or where heating and cooling is required on the same site such as meat processing plants, pharmaceutical buildings, hospitals and district heating projects.

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Published by ARROW@TU Dublin, 2021

New climate legislative tools

The European Commission has adopted a new package of proposals to make the EU's climate, energy, land use, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

Achieving these emission reductions in the next decade is crucial to Europe becoming the world's first climate-neutral continent by 2050 and making the European Green Deal a reality. Therefore, the new proposals incorporate the legislative tools to deliver on the targets agreed in the European Climate Law.

The proposals will enable the necessary acceleration of greenhouse gas emission reductions in the next decade. They combine the following key elements:

- Application of emissions trading to new sectors and a tightening of the existing EU Emissions Trading System;
- Increased use of renewable energy;
- Greater energy efficiency;
- A faster roll-out of low emission transport modes and the infrastructure and fuels to support them;
- An alignment of taxation policies with the European Green Deal objectives;
- Measures to prevent carbon leakage;
- Tools to preserve and grow our natural carbon sinks.

To reduce overall energy use, cut emissions and tackle energy poverty, the Energy Efficiency Directive will set a more ambitious binding annual target for reducing energy use at EU level. It will guide how national contributions are established and almost double the annual energy saving obligation for member states. The public sector will be required to renovate 3% of its buildings each year to drive the renovation wave, create jobs and bring down energy use and costs to the taxpayer.

In addition, the tax system for energy products must safeguard and improve the Single Market and support the green transition by setting the right incentives. So, a revision of the Energy Taxation Directive proposes to align the taxation of energy products with EU energy and climate policies, promoting clean technologies and removing outdated exemptions and reduced rates that currently encourage the use of fossil fuels.

Meanwhile, a new Carbon Border Adjustment Mechanism will put a carbon price on imports of a targeted selection of products. This will ensure that European emission reductions contribute to a global emissions decline, instead of pushing carbon-intensive production outside Europe.

While the benefits of EU climate policies clearly outweigh the costs of this transition, climate policies risk putting extra pressure on vulnerable households, micro-enterprises and transport users in the short run. Therefore, the design of the policies in the new package of proposals fairly spreads the costs of tackling and adapting to climate change.

A new Social Climate Fund is proposed to provide dedicated funding to member states to help citizens finance investments in energy efficiency, new heating and cooling systems, and cleaner mobility. It will provide €72.2 billion of funding for the period 2025-2032, based on a targeted amendment to the multiannual financial framework. With a proposal to draw on matching member state funding, the fund would mobilise €144.4 billion for a socially fair transition.

See https://ec.europa.eu/commission/presscorner/detail/en/ip_21_3541 ■

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- Up to 10 metres flue length

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- Compact size, H700mm W390mm D280mm
- Rear flue option
- ErP A-rated for efficiency
- Quiet Mark approved
- Easy to fit and install
- Modulating Grundfos pump
- Low running costs
- Up to 10 metres flue length

Energy Regular

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- Outputs – 12kW, 15kW, 18kW, 25kW or 30kW
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COVER STORY

Ventilation – key to safe emergence from the Covid-19 pandemic

Dara McGowan

Dara McGowan is a Technical Consultant in Partel, a company with Irish roots who manufacture and supply high-performance systems and materials for the low-energy building sector, including a variety of ventilation systems. Dara has an in-depth understanding of ventilation regulations and a practical knowledge of how ventilation systems work. He developed the national skills specifications for the Department of Housing Planning and Local Government-supported NZEB Ventilation course offered by the Waterford and Wexford Education and Training Board (WWETB), and continues to provide support for tutors delivering these courses. In this article McGowan outlines the importance of adequate ventilation as we emerge from the coronavirus pandemic.

What the experts say

Face coverings, social distancing, good hand hygiene and vaccination have been strongly encouraged by the World Health Organisation as measures to combat Covid-19. In addition to these measures and with a focus on returning to indoor gatherings, numerous organisations have identified improved ventilation as a crucial building control initiative for minimising the risk of Covid-19 transmission.

The US Environmental Protection Agency explains that increasing outdoor air ventilation helps reduce the concentration of airborne contaminants, including viruses. Increased ventilation also reduces surface contamination by removing some virus particles before they have the chance to land on surfaces. The World Health Organisation also believes that understanding and controlling ventilation can "reduce the risk of indoor health concerns, including preventing the virus that causes Covid-19 from spreading indoors."

An ASHA publication agrees and adds that filtration should be a key consideration when mechanical ventilation is used. The UK and Irish Governments have also identified ventilation as a key consideration as we move towards reopening, with both establishing a panel of experts to research how best to improve ventilation. While there are different recommendations for improving ventilation based on building type and existing ventilation strategy, the general consensus from the experts is that increasing outdoor air ventilation reduces the risk of Covid-19 transmission.

How to increase ventilation in buildings?

The ability to increase ventilation in a building depends on the ventilation strategy being used. As indoor activities resume, business owners appear more interested in their ventilation strategy than ever before. In particular, school and office ventilation enquiries have significantly increased this year.

Ventilation strategies can be divided into two broad categories – natural ventilation and mechanical ventilation. Natural ventilation is the traditional ventilation strategy used in Ireland, where passive intake ventilators, hole-in-the-wall vents for example, are used to facilitate air movement. Mechanical ventilation relies on motorised fans which typically run 24 hours a day, pulling or pushing air in or out of the building.

Where a building is naturally ventilated, we have limited control over the ventilation system itself. Instead, we utilise the buildings "purge ventilation" strategy. Purge ventilation is designed into buildings to ensure they can deal

with excess ventilation demand from time to time. This is typically done using openable windows and/or doors. In their *Practical Steps for the Development of Good Ventilation Practices in Schools V3 guidelines,* the Department of Education essentially encourages teachers to open windows and doors during class to reduce the risk of Covid-19 transmission. Where possible, windows on opposite sides of a room/building should be opened as this creates a cross-ventilation effect.

While all new buildings must meet minimum purge ventilation requirements, some existing buildings may be incapable of increasing ventilation through these means, in which case ventilation upgrades should be considered. It is worth noting that purge ventilation poses inherent challenges such as noise, security, pollution and of course discomfort.

Mechanical ventilation

The US Environmental Protection Agency has encouraged increasing ventilation in schools, offices and commercial spaces through the use of mechanical systems. Mechanical ventilation can be divided into several subcategories, which we will elaborate on later. Most mechanical ventilation systems are designed to meet a "general ventilation rate". This is the amount of air the ventilation system is moving in its normal setting, typically measured in litres per second (l/s) or cubic metres per hour (m^3/hr).

The general ventilation rate can be calculated in a number of ways, depending on the building type and whether the building is new or old. For example, for a new dwelling in Ireland the Building Regulations typically require 0.3l/s per square meter of floor area. Here in Partel, we aim for this requirement when designing ventilation upgrades in existing dwellings as well, ensuring we achieve modern-day air quality standards for the occupants.

The general ventilation rate for an office space or school, on the other hand, is typically based on the number of occupants on each floor of the building. When designing any ventilation system, it is good practice to size the units to allow for additional ventilation when necessary. Therefore, a premises with a well-designed mechanical system can increase the ventilation rate where the risk of Covid-19 transmission is high by simply adjusting the setting on the ventilation system. While dealing with Covid-19 the World Health Organisation recommends 10l/s per person in both residential and non-residential settings, and 60l/s per patient (or six air changes) in healthcare facilities.

For business owners, landlords and homeowners, I strongly encourage you to reach out to a ventilation designer who can calculate an appropriate minimum ventilation rate for your property. This will help determine whether the existing system is adequate or not. This service is often available for free, as with here in Partel, as part of the technical support we provide.

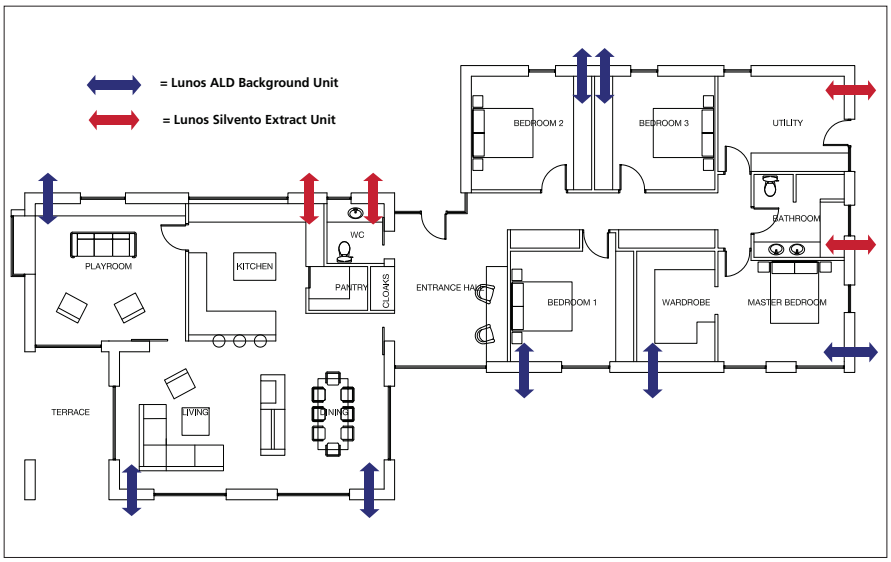
Inadequate ventilation – what are the options?

When upgrading a building's ventilation system, you must first decide what ventilation strategy you want to utilise – natural ventilation, a continuous mechanical extract (CMEV) system, or a mechanical ventilation system with heat recovery capabilities (MVHR). In my experience, natural ventilation is no longer popular in Ireland and so I will not elaborate on this system here.

Continuous extract systems are typically the most cost-competitive form of mechanical ventilation. Such systems continuously extract air from the wet rooms of a building using fans, while fresh air is drawn into the building via background ventilators installed in habitable rooms. This type of system can achieve excellent indoor air quality, can be incredibly quiet and can operate at an almost negligible cost.

LUNOS Nexxt Unit uses counterflow heat exchange technology.

LUNOS E260 unit uses regenerative heat exchange technology.



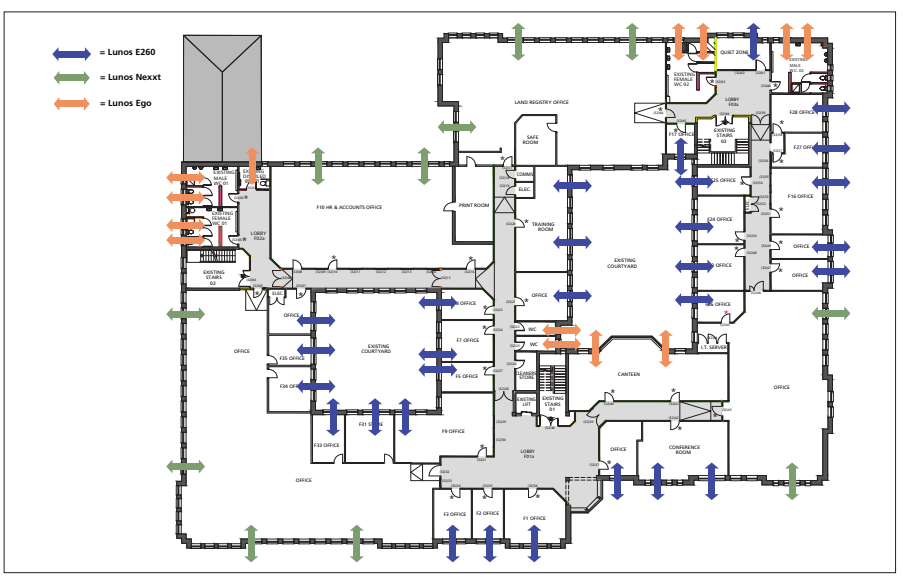
Sample decentralised CMEV design for a domestic project.

Clever extract systems, such as the LUNOS Silvento unit, can even respond to demand, increasing ventilation rates automatically in response to movement, humidity, time, temperature, CO2 or VOCs. While CO2 does not directly indicate Covid-19 in a room, it has been identified as a key indicator of poor air quality, and hence a CO2-sensitive ventilation unit can be a valuable tool in minimising transmission risk. The only obvious downside to such extract systems is that they do not recover heat, which can impact energy bills and occupant comfort.

Where budgets allow, mechanical ventilation with heat recovery is the best ventilation strategy to utilise in most occupied buildings. Such systems have all the benefits of an extract system, but in addition can recover most of the heat from the outgoing air and use it to temper the supply air. This can be done through a variety of heat recovery methods, counter flow and regenerative heat exchange (see Image 2) to name just two. (See images previous page).

It is important to note that such heat recovery systems are not recirculating, and so the risk of Covid-19 transmission is not increased via the heat recovery process (recirculation of air is highly discouraged when attempting to minimise virus transmission). In practice, MVHR systems supply air at a higher temperature, keeping occupants comfortable, while significantly reducing the building's energy demand.

In one office renovation project Partel designed and supplied recently, it was shown that the LUNOS Nexxt MVHR system reduced the energy demand for space heating by 76%.



Full decentralized MVHR design for a large office building.

How disruptive is a ventilation upgrade?

Achieving adequate ventilation for a new building is much less complicated than doing so in an existing one. Space can be allocated for the ventilation unit, while ceiling heights can be specified to accommodate dropped ceilings to hide ductwork. However, there are thousands of existing homes, business and education buildings across the country that are in desperate need of ventilation upgrades. If a home has mould issues, an office gets stuffy or students are struggling to stay awake during class, the building likely has inadequate indoor air quality.

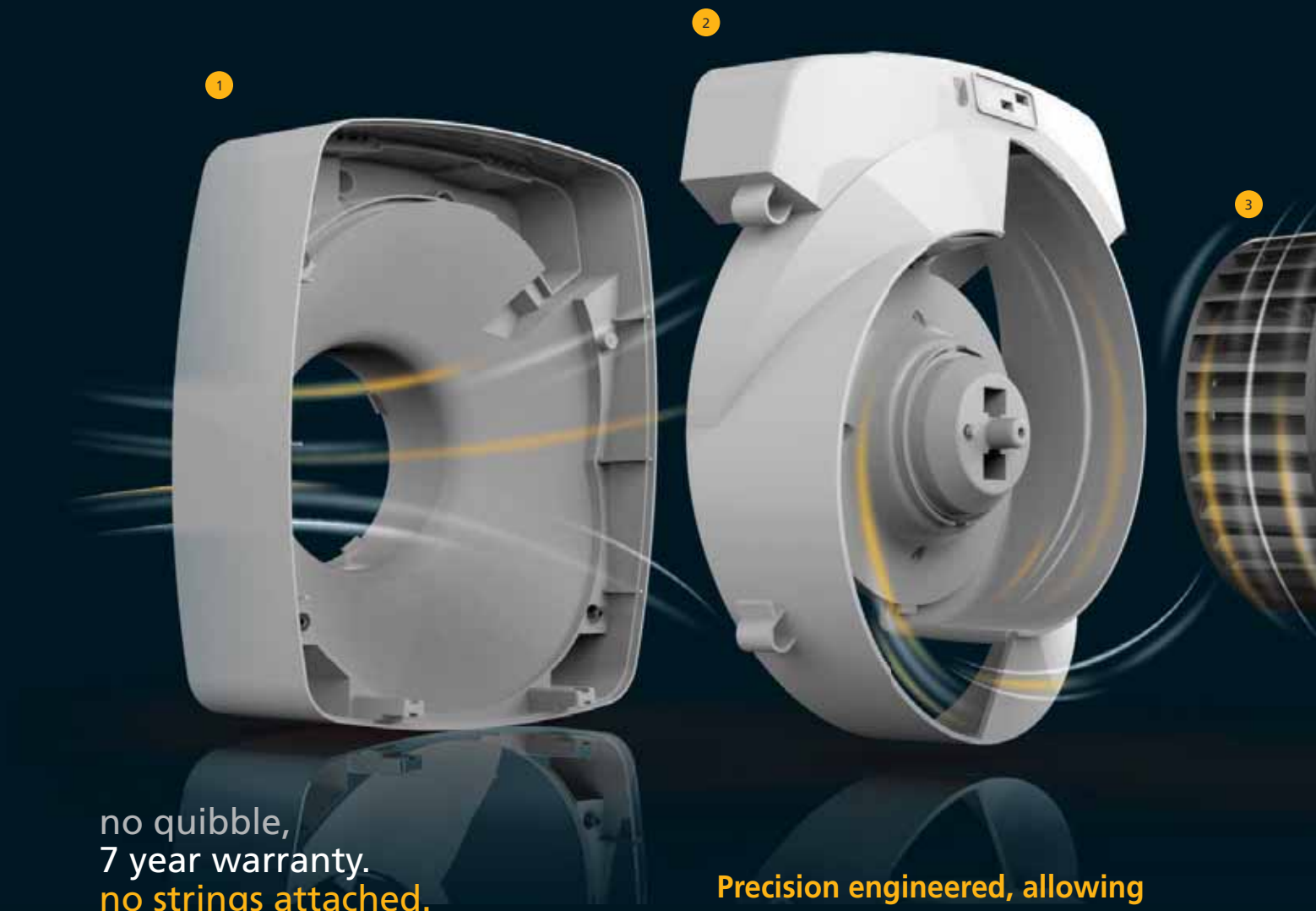
While these effects were somewhat tolerable before, the correlation between poorly-ventilated spaces and Covid-19 super spreader events has prompted people to prioritise air quality. Luckily, there are systems on the market that are particularly suitable for retrofitting. Partel is the official distributor of the LUNOS ventilation system in Ireland and the UK. LUNOS specialises in decentralised CMEV and MVHR ventilation systems, which make them incredibly simple to retrofit. Indeed, there are several ventilation suppliers in Ireland who will design a system free of charge – upgrading your ventilation system may be less disruptive than you think.

The *Lancet* Covid-19 Commission views the return to school as a "once-in-a-generation opportunity for health-based improvements to school buildings, such as improving indoor air quality". I believe this statement can be applied more widely to all buildings. Covid-19 has highlighted the importance of indoor air quality and finally encouraged many homeowners, landlords and building managers to look for ways to improve ventilation.

Adequate ventilation is one of the key factors to minimising Covid-19 transmission and so should be given due attention. Ventilation strategies must be realistic, user-friendly and appropriate for each individual project if they are to be effective and, in my opinion, should also aid in the constant battle against climate change, a true global crisis in itself. ■

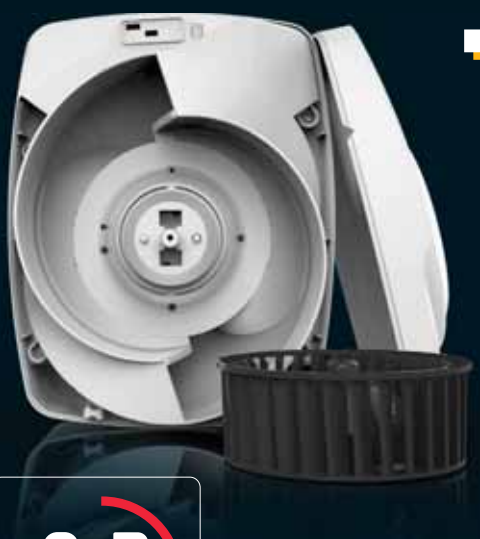
Decentralised MEV

S&P infinityNB



no quibble,
7 year warranty.
no strings attached.

Precision engineered, allowing us to offer a 7-year warrant



7

We are absolutely confident that we can offer a 7 year no quibble maintenance-free warranty because we have been running an accelerated life test programme for nearly 10 years on the Infinity's predecessor – the original Filterless Fan - without a single breakdown.

Our R&D teams are continually testing and improving this technology to make it perform even better for longer. Following extensive testing and research we have further engineered the airflow of the Infinity NB with exact precision to achieve the optimal efficiency out of the highest quality bearings. The stylish new front grille allows the air to pass through with the least possible resistance to achieve the quietest performance.

S&P

Global strength …
applied locally

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the simplest solution to whole-house ventilation

Decentralised MEV using S&P's filterless Infinity NB extract fan

Decentralised mechanical extract ventilation is the process of achieving a whole-house general ventilation rate using wall mounted, low trickle, extract fans in each wet room. The combination of these fans creates a whole-house extract rate to improve indoor air quality, while supply air is maintained through existing background ventilation or window trickle vents in each habitable room of a new-build or existing property.

The S&P fan offers a choice of two trickle speeds and two boost speeds so that suitable rates of airflow can be achieved to satisfy Part F Regulations.

A humidity-controlled variable rate of extract ensures a constant monitoring of relative humidity levels to maintain suitable air quality and reduce energy consumption.

Features and Benefits

- Removable impeller. No filter. For hassle-free, rapid and safe cleaning.
- Exchangeable cartridge system provides the lowest ever lifecycle costs to save housing providers millions of pounds in maintenance and replacement costs.
- Ultra low energy consumption. Long trouble free life, less costs.
- Intellitrac® humidity tracking control. No need for user intervention, the Filterless Infinity reacts quietly to reduce high humidity before condensation can start to occur
- Pullcord as standard. Can be switched to boost mode with the use of the pullcord for odour control.
- Whisper quiet running. Eliminates one of the biggest complaints about noisy fans.
- Future-Proofed to Comply. Meets the airflow requirements of a typical new build dwelling.

E: sales.ie@solerpalau.com *T: 01 412 4020*

Wilo-Stratos GIGA2.0 'Next Generation'

Smart, reliable, efficient

Reliable supply plays a central role in building services, especially in big buildings, where large volume flows have to be transported, sometimes with high delivery heads to provide the heating and cooling capacity. The Wilo-Stratos GIGA2.0, one of the first smart glanded in-line pumps on the market, proves that efficiency and smart technology can both be put to good use.

"Our smart glanded in-line pump provides many interfaces for multi-pump control, integration into building automation, production data acquisition and state-of-the-art options for mobile access via Wilo-Smart Connect," explains Wilo Managing Director Derek Elton. "Among other things, this enables the pumps to be configured and operated via Bluetooth using a mobile device. There is also the option of remote access and multi-pump control via networking the Wilo-Net bus system."

Using the optional Wilo-CIF module, the Wilo-Stratos GIGA2.0 provides another interface that enables modern and secure Ethernet communication with the building automation system via the proven protocols of BACnet IP and MODBUS TCP.

Intuitive and safe commissioning

The continuous development of the Wilo-Stratos GIGA, which has been proven time after time in the field, is further evidenced by numerous studies conducted in the market which highlight the key benefits and features. "For instance," continues Derek Elton, "time is a huge factor for operators and installers alike, so ease of installation and intuitive operability are vitally important and are integral to the design of the Wilo-Stratos GIGA2.0.

"In addition, the Wilo-Stratos GIGA2.0 also has an application-guided setting assistant for optimum control of the pump from an application point of view. It is controlled by our proven Green Button Technology, with all steps shown transparently via the large display on which all operating data can also be read for analysis and optimisation."

Right: "Next Generation" Wilo-Stratos GIGA2.0.

Efficiency and reliability

The optimum energy efficiency of the overall system is achieved by the intelligent interaction of IE5 EC motor technology with proven pump hydraulics (MEI 0.7), as well as innovative control functions and individual optimisation options. It is this innovative drive technology, working in combination with proven pump hydraulics, that delivers maximum performance and reliability.

Contact: Wilo Ireland.
T: 01 – 426 0000;
E: sales.ie@wilo.com ■

Features and benefits

- Bluetooth interface;
- Interfaces for integration to BA;
- IE5 EC motor technology;
- Setting assistant;
- Differential pressure sensor 2-10V;
- Easily accessible cable connections and terminals.

Polytherm® Heating Systems Hevac origen a force from nature

Helping consultants and installers deliver renewable solutions

Hevac Ltd is one of Ireland's leading domestic, commercial and industrial plumbing and heating specialists with offices and warehouse facilities in both Dublin and Cork. Established in 1974, it has always been to the fore in introducing advanced technologies and innovative solutions to meet the needs of the building services engineering sector.

It is part of the Hevac Group of companies and now, together with sister-companies Origen Energy and Polytherm Heating Systems, it is once again showing market leadership by introducing cutting-edge, renewable solutions that spearhead the drive for sustainability. These solutions cover all heating and cooling solutions, be they centralised or de-centralised systems.

The combined strength of the three companies makes for a formidable force and represents a wealth of experience, technical know-how and engineering expertise that is unrivalled in the industry. That, coupled with the broad-ranging portfolio, sets them apart from other industry players so that, when it comes to renewables, they have every eventuality covered.

Calin Tasnadi with Donal Stafford, John O'Brien, Paul Devereaux and Shane Duffy.

Market-leading brands

Right from the outset the emphasis at Hevac, and indeed Origen and Polytherm, has always been on quality products and systems from established, high-profile manufacturers. Over the years this approach was reinforced and today the portfolio represents all the market-leading players in the sector.

Apart from the products, an additional benefit is the longevity and strength of the trading relations enjoyed with these principals. These are true partnerships that also facilitate access to research and development data and other technical support mechanisms.

Heat pump specification

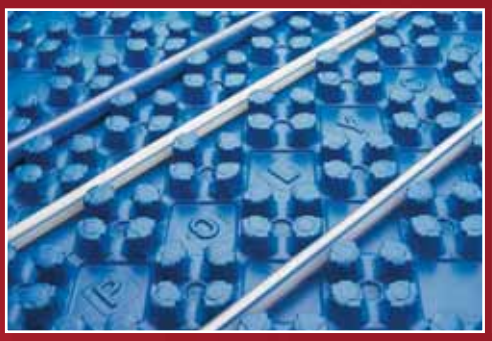
Heat pumps are at the very heart of the renewables drive and, between them, Hevac, Origen and Polytherm comprehensively cover all the bases. The design team can produce project-specific solutions for both new-build and retrofit domestic and commercial installations.

In addition, supporting documentation such as SR50 calculations and CAD drawings are provided, along with the checking of Building Regs – Part L & Part F compliance; designer/installer sign-off forms; documentation and technical support for the BER assessor; and advise for DEAP compliance.

Stock availability and logistics

Once the design is in place and the constituent products and controls specified and ordered, getting them to site on time, and to suit the construction schedule, is essential.

Hevac carries substantial stocks and has a professionally-run logistics operation that coordinates all deliveries from each of its three Dublin branches and its Cork outlet. Being responsible for the entire project gives it far greater control over this process and is doubly assuring for the client.



Training and showroom

The use of renewables in heating and cooling technologies is relatively new, as is the fast-changing pace of technology development. That's created a skills shortage whereby existing engineers need to upskill, while new entrants need fundamental training and education.

Consequently, Hevac has made significant investment in a new, purpose-designed training centre at its office and warehouse complex in Santry, North County Dublin. This state-of-the-art facility includes the full complement of functioning heating and cooling solutions available from the company, all of which are fully integrated to demonstrate the importance of system solutions.

The ongoing programme of workshop and training modules is designed to deliver an understanding of the fundamentals of renewable technology, the design principles behind them, and hands-on experience of the installation process. Tailored modules can also be devised to suit different companies or individuals.

What happens next to the elephant is inevitable …

… however, what's about to happen in the building services engineering sector is much harder to predict. Thankfully, ***Building Services Engineering*** can help you do that with a wealth of news, feature articles, expert opinions and detailed product information.

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Lossnay RVS simultaneously extracts stale air and supplies fresh, filtered air, while recovering valuable heat energy at the same time.

Lossnay RVS makes for safe, healthy environments

According to Robin Marks, Northern Ireland Sales Manager, Mitsubishi Electric, up until recently people paid far more attention to what they eat and drink than to what they breath. Despite consuming around 2kg of food and 3kg of fluids, they inhale and exhale about 13kg of air per day. However, and mainly because of Covid-19, people are now acutely aware of the importance of the quality of the air that they breath.

That said, there seems to be huge ignorance surrounding the factors that influence air quality and so, Mitsubishi Electric has embarked on a major education process, coupled with specially-developed products, to better inform engineers, installers and indeed the general public. This is especially true for the commercial marketplace where the challenge of making offices, restaurants, factories, schools, libraries and so on safer is very urgent now that Covid-related restrictions are easing.

The newly-introduced Lossnay LGH-RVS-E commercial series is ideally suited to meet this challenge and is the perfect complement to the established, market-leading LGH range from Lossnay. This newly introduced RVS range of fresh air ventilation products is designed to simultaneously extract stale air from a commercial building and supply fresh, filtered air. While doing this, the Lossnay RVS units also recover valuable heat energy for maximum efficiency.

Ideal for ventilation

Lossnay RVS is ideal for ventilation in higher humidity applications as the traditional Lossnay paper core has been replaced by a plastic version. Alongside this, the new PZ-62DR-E controller and CO2 sensors make for a significant step-change in the ease of commissioning and control.

There are two condensate trays in the unit, each for the SA and EA side to account for all scenarios in both heating and cooling seasons.

This new product is all part of the dynamic Lossnay brand from Mitsubishi Electric which is constantly expanding to include new and innovative solutions. It also now covers residential ventilation, as well as being part of Mitsubishi Electric's IAQ solutions which include the Plasma Quad Technology products range.

Features and benefits

- Fresh air ventilation with energy efficient heat recovery;
- Perfect for higher humidity environments;
- Plug and play CO2 sensor control, including power;
- Digital commissioning of fan speed increments;
- Easy control interlock with Mr Slim and City-Multi;
- M-NET connection for centralised control;
- Integrated bypass damper for free cooling;
- In-built condensate drainage traps.

Contact: Mitsubishi Electric.
T: 01 – 419 8800;
E: sales.info@meir.mee.com ■

Mèta – a truly revolutionary pump

A variable speed, multi-stage, self-priming pump with incorporated electronics – this is a very brief description of Mèta, the new pump from the e-idos line that Calpeda has recently introduced to the market.

Even though it looks the same as the other pumps made by Calpeda, it is different. Important changes are usually associated with changes in shape, but in this case the revolution is all about substance. Actually, the true challenge with the new pump range was inserting technological innovation into the characteristic design of Calpeda pumps.

"So, if you look at the new Mèta model and think it's a traditional product, then that means we made the right choice," says Graham Fay, Calpeda Ireland. "We have made sure that the compactness and various size options of the new pump, with its on-board variable speed control, have remained the same as other Calpeda pumps so that it fits perfectly into traditional installations."

Mèta eco-friendly heart

When is an innovation truly an innovation? When it is accessible on a large scale and, as a result, can bring a real advantage and deliver a positive environmental impact. "This is the true revolution of Mèta," continues Fay. "Designed as a very high-efficiency pump, Mèta has an eco-friendly heart that can make the difference in the commercial and domestic pump sector for water supplies and irrigation.

"The saving in energy usage with this new product – approximately 550kWh per year when used an average of four hours per day – can be seen immediately. Nor is the advantage merely economic. If this value is converted into amounts of CO_2 not released into the atmosphere, the total comes to approximately 400kg per year. Being a variable speed pump, Mèta can control the speed of the pump according to the water demand. This alone makes it a solution centred on saving energy. But its performance is much higher than average and its footprint is decidedly ecological."

What makes Mèta so special?

Extremely energy efficient, Mèta is a perfect example of the EU's Ecodesign and Extended Product Approach initiatives. It fully observes the new regulations whereby the product is assessed and judged in its entirety (pump, motor and controller). It can be described as a product with top-grade integration, characterised by the electronics in the motor casing and the control algorithms that make it very efficient. The result? 60% less energy consumption than an already-efficient pump.

Savings in raw materials

The consumption of raw materials, which is continually increasing, is a very important aspect for the environment. To produce the new Mèta, Calpeda says there was a base material saving (iron, copper and aluminium) of 45% when compared with a traditional pump. In addition, the optimised motor and controls mean that a physically smaller unit can be used while maintaining the same levels of performance. Finally, operation at a low temperature helps the motor and the bearings last a good deal longer.

Contact: Graham Fay, Calpeda Ireland. T: 086 - 819 3059; E: graham@calpedaireland.com

Mèta, a variable speed, multi-stage, self-priming pump with incorporated electronics.

Perfect air quality with

AIRFIX ACTIVE

Airfix Active from Euro Gas is designed to provide a high level of air filtration, surface purification and sanitisation for all indoor, medium-crowded, locations. It limits contamination and the diffusion of bacteria and viruses, including SARS-CoV-2.

Active sanitisation
It features Active Sanitisation (photocatalytic oxidation) that eliminates most of the toxic and pollutant compounds in the air.

The advantages

- Continuous sanitisation;
- Active treatment of locations and surfaces;
- Removal of germs, bacteria and virus;
- Removal of bad smells;
- Reduction of ultrathin micro particles;
- Reduction of dust;
- Better air quality.

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www.eurogas.ie

FläktGroup Ireland raises the sails on its flagship AHU

Industry 4.0, IOT and the cloud are familiar buzzwords when discussing industrial communication, with connectivity no longer tied to complicated processes or complex systems, but now an integral part of our everyday lives. Indeed, FläktGroup Ireland has fully embraced this innovative technology as it strives for continuous improvement regarding quality, cost benefits and advanced control across its full product portfolio.

FläktGroup eQ air handling unit.

This is particularly evident in its flagship eQ family of air handling units that incorporate the new ISYteq 4.0 control system. The latest incarnation of the already-proven ISYteq technology, the new eQ Top and eQ Prime AHU ranges now include the powerful ISYteq 4.0 integrated control system. Upgraded features include an intuitive and ergonomically-designed 7" touch-screen panel called ISYteq Touch 7.0. This state-of-the-art technology makes navigating the AHU settings and setpoints intuitive and is supplied as standard with every air handling unit.

In addition, the controller includes enthalpy control for reduced running costs, along with automatic pressure balancing across the rotary heat exchanger to eliminate recirculation of airborne particles. This keeps the supply air free from contamination, which is essential for maintaining a healthy indoor environment.

As for energy monitoring, it can be interrogated down to component level and is available directly from the HMI, cloud connectivity and via communication to BAS/BMS. This allows the end-user to identify performance-related improvement and leads to optimisation of the AHU. The boost function will ensure the building maintains set comfort conditions during a scheduled timeframe, in addition to VOC and CO2 monitoring.

The powerful ISYteq Touch 7.0 integrated control system from FläktGroup Ireland.

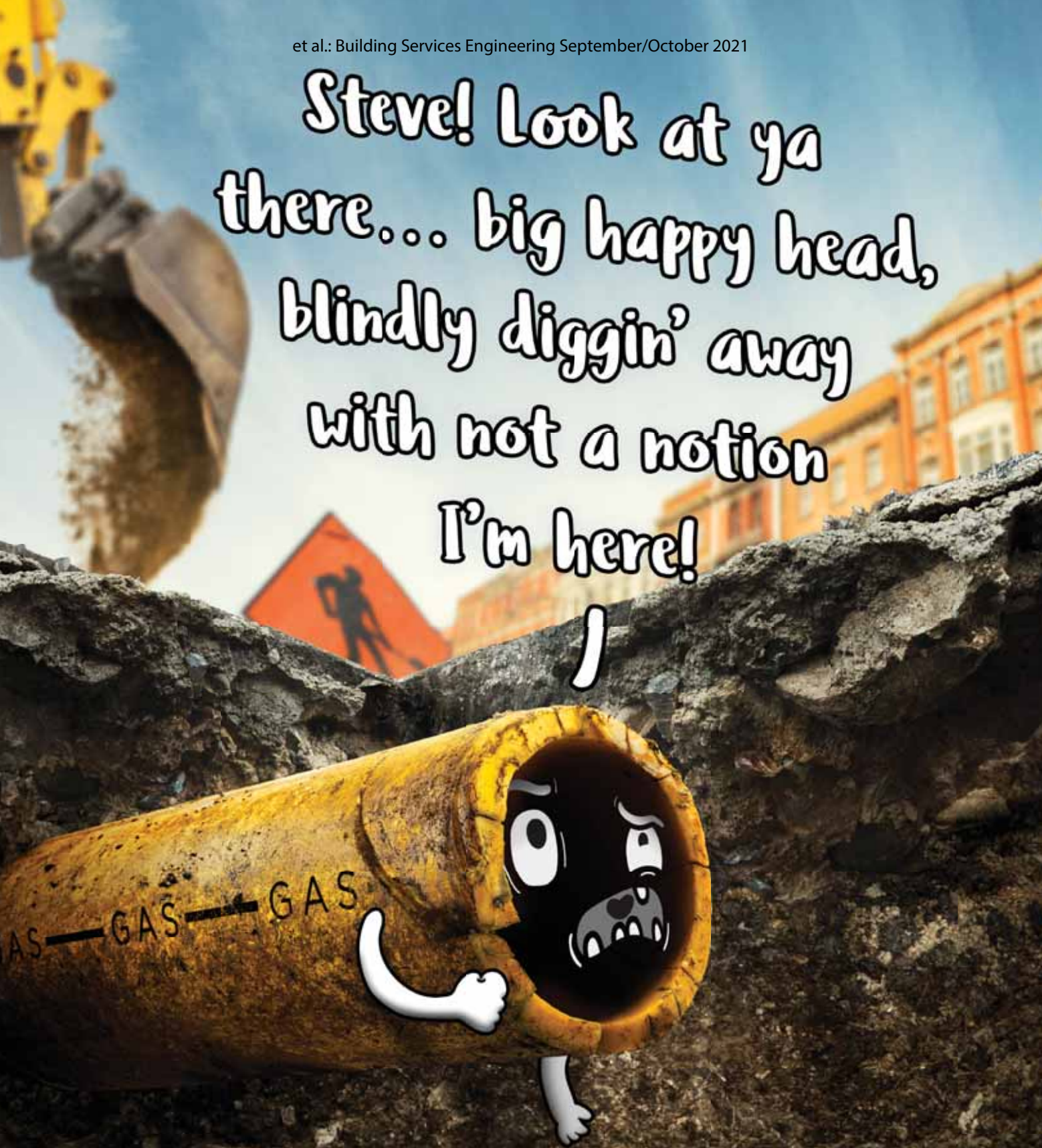
Importantly, the user interface can be accessed via the local touchscreen or local web page. Additional functions include the easy-to-use "Start-Up Wizard" to speed up onsite commissioning and improve user experience; live trend logging and graphing with options to export data; and a live unit-specific graphical flow chart for a quick overview of how the AHU is performing. Descriptive alarm handling is also available, along with an easy-to-use setpoint adjustment.

As communication and connectivity are key features of ISYteq 4.0, the new eQ controllers come with native BACnet IP, BACnet MS/TP, Modbus RTU, Modbus TCP and cloud connectivity (optional).

In addition, FläktGroup's secure 24/7 remote access cloud portal functions include remote reading and setting of setpoints; a live data graph; data point trend logging and limit setting; active/historical alarms; alarm acknowledgment; and alarm forwarding via email or SMS. These come in the form of optional licenses which can be ordered with the unit and integrated at production stage.

FläktGroup Ireland understands the importance of communication and connectivity and, thanks to a century of accumulated experience, now offers high-quality solutions that include innovative technologies and deliver outstanding performance.

Contact: Dean Clarke,
Product Controls Manager,
FläktGroup Ireland.
T: 01 – 463 4600.



Using connected data to solve business challenges

Data is a strong indicator of business success, so it's vital to have a digital solution to connect it. Having job management software in your business can help you quickly gather, analyse and act on your data from one spot.

As a result, you can answer key questions about your business and easily pinpoint underperforming areas to boost productivity and improve cash flow, such as:

Which jobs are most profitable?
With all of your data centralised, you can measure the profit and loss of each specific job. You can quickly identify and improve any patterns or processes that repeatedly occur in jobs reporting losses.

Who are your best customers?
Job management software with reports that rank customers by turnover, profit margin and average invoice value can help you pinpoint loyal customers who are vital to improve cashflow long-term.

Which customers have overdue payments?
With data in one location, you can run regular reports showing all customers with overdue outstanding invoices and each overdue amount. This helps you quickly spot large overdue invoices so you can chase them down and improve your cashflow position.

Are projects on track and within budget?
Job management software helps you run reports that compare original and revised project estimates so you ensure the project stays within budget. The project owner can also use these reports to drill down and see where to reduce costs.

Do you have the right materials in stock?
Using job management software to run stock reports ensures that both field and office staff can quickly identify whether they have the right materials in the right location to complete the job.

Stock management reports can also help to quickly relocate materials and know when to order new materials ahead of a job. With the right materials in stock at all times, you increase overall job profitability and ensure consistent cash flow.

With the connected data, you can solve your business challenges faster and run a more efficient business overall.

simPRO 's job management software solution manages all service, project and maintenance work and includes over 60 in-built reports and advanced BI reporting to help businesses understand and act on their data.

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HEAT PUMPS

Current proposals insufficient to realise 2050 objectives

Distorted price mechanism the elephant in the room

REHVA Federation of European Heating, Ventilation and Air Conditioning Associations

Despite a challenging market environment, European heat pump sales grew by +7.4% in 2020, with 1.62 million units being sold across Europe, a number that marks a new record hight. Assuming a life expectancy of approximately 20 years, the current European heat pump stock amounts to 14.86 million units (see Figure 1), 13.2 million of which are heating heat pumps. Putting this into the perspective of between 115 and 120 million residential buildings in Europe, the heat pump market share in the building stock is about 11%, *writes Thomas Nowak, Secretary General, European Heap Pump Association (EHPA)* (below), in an article reproduced here from the *REHVA Journal* (April) 2021.

Heat pump market growth is mainly influenced by three trends:

(1) From a technology perspective, today's heat pumps can cover a wide temperature range. They can operate at outdoor temperature levels of down to -25°C and increasingly they provide hot water at 65°C in an efficient manner. That enables their deployment in a much larger share of buildings than a decade ago. Hybrid systems enable heat pumps to be used even in completely unrenovated parts of the renovation segment. Considering the industrial and large thermal capacity segment, heat pumps can provide 50MW and more if installed in cascade, and heat pumps under development will be able to provide outputs of up to 160°C/200°C.

(2) The need to also accelerate the energy transition of the heating and cooling sector moves heat pumps to the centre of attention of policy makers. Legislation passed in the past eight years is now transposed in all member states and is starting to show impact. Building standards limit maximum heat demand per square meter, mandate the integration of renewable energy and favour smart buildings. This is often substantiated by institutional and financial subsidies that make market development easier.

(3) Continuously larger and growing sales numbers result in lower cost. Economies of scale are materialising on the component and the product level. The fast decline of the production cost of PV systems also influences the heating market: using self-produced electricity in combination with a heat pump system provides a very low-cost energy source for buildings. Additional benefits like demand-response services provided to the grid (which could become a business model and provide an income for providers) are on the horizon, but have not yet materialised.

These developments contribute to the development of Europe's heat pump markets (see Figure 2). Most markets experienced substantial growth. The strongest relative gains were achieved in Poland (+43.8%), Germany (+37.2%), and the Netherlands (+30.5%). Declines

	Sales	Stock
2005	446 037	1.15 million
2006	509 794	1.66 million
2007	589 118	2.24 million
2008	804 457	3.05 million
2009	734 282	3.77 million
2010	800 388	4.57 million
2011	808 591	5.37 million
2012	750 436	6.11 million
2013	769 879	6.87 million
2014	792 621	7.64 million
2015	892 809	8.52 million
2016	999 682	9.49 million
2017	1.12 million	10.58 million
2018	1.27 million	11.81 million
2019	1.51 million	13.29 million
2020	1.62 million	14.86 million

Figure 1: Development of heat pump sales and stock, EU-2.

are notable only in Norway, with -12.6% fewer heat pumps sold in 2020. For Estonia, Ireland and Belgium 2020 market figures are not yet available. Until they are reported, last years' sales numbers are used.

The development of sales, especially against the backdrop of the Covid-19 pandemic, indicates a strong and continuous market expansion for the heat pump industry in Europe with 87% of the European market volume sold in only 10 countries. The five biggest European heat pump markets in 2020 were France (394,129 units sold; -0.7% growth vs. 2020); Italy (232,834; +12.2%); Germany (140,390; +37.2%); Spain (127,856; -0.2%); and Sweden (107,723; +4.4%).

The biggest absolute gains were achieved in Germany (38,040), Italy (25,324), Poland (18,504), the Netherlands (13,475) and Denmark (5,117). In relative terms, seven markets showed substantial increases above 10%.

The Nordic countries show the biggest market penetration for heat pumps in the building stock, and also experience significant shares of the technology in the renovation sector. In summary, Sweden, Norway, Denmark and Finland grew by 677 units. The decrease in Norway (-13,233) is offset by gains in Denmark (5,117), Sweden (4,701) and Finland (4,093). However, it should be noted that figures for the Swedish market do not include the growth in air-air heat pumps. Thus, the Swedish market does look better in reality than what the data indicates.

While Norway's market is maturing today, its development history reveals a significant growth perspective for Europe. If all countries had the same market penetration as Norway, annual heater sales would be dominated by heat pumps. Consequentially, this would go in parallel with a significant decarbonisation of the heating sector.

In 2020, heat pumps with a thermal capacity of 14.24GW were installed producing approx. 27.11TWh of useful energy and integrating 16.92TWh of renewables in heating and cooling, while avoiding 4.31Mt of CO2-equivalent emissions.

In order to produce the 2020 sales volume and to maintain the installed stock, a total of 89,784 FTE of employment was necessary. Obviously, real employment related to the heat pump market is larger, as not all employees work full-time on heat pumps only.

For policymakers, this is good news as it shows a huge untapped potential to reduce Europe's energy demand for heating, cooling and hot water production.

However, achieving it by 2030 would require an annual 15% growth rate and a tremendous effort with

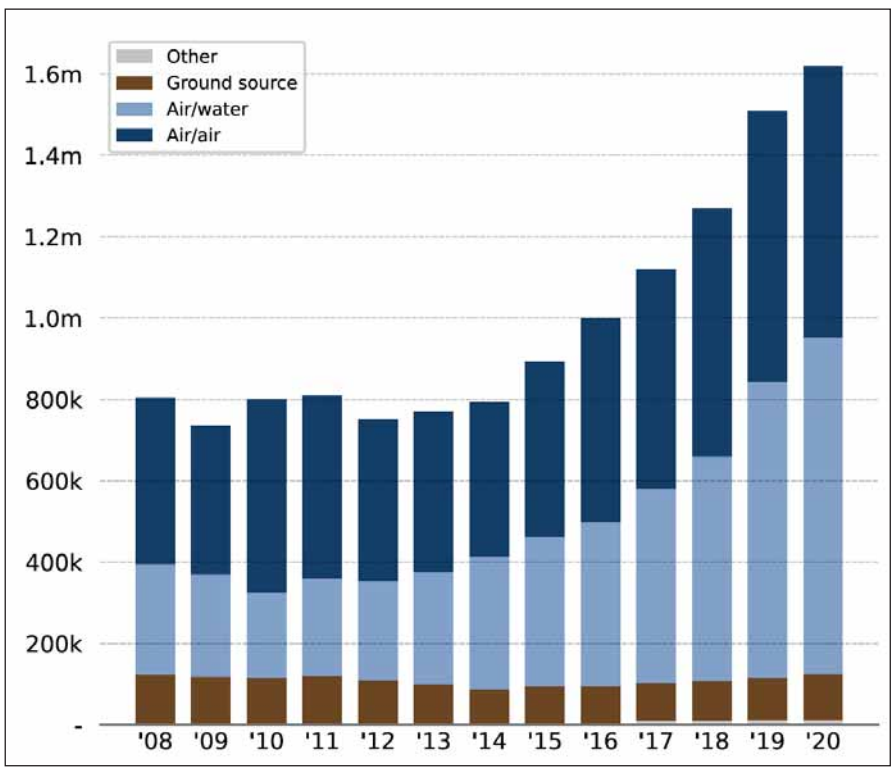

Figure 2: Sales development by type ("H-" indicates primary heating function).

The perfect complement

to the Ideal Classic NEO 20 underfloor heating system

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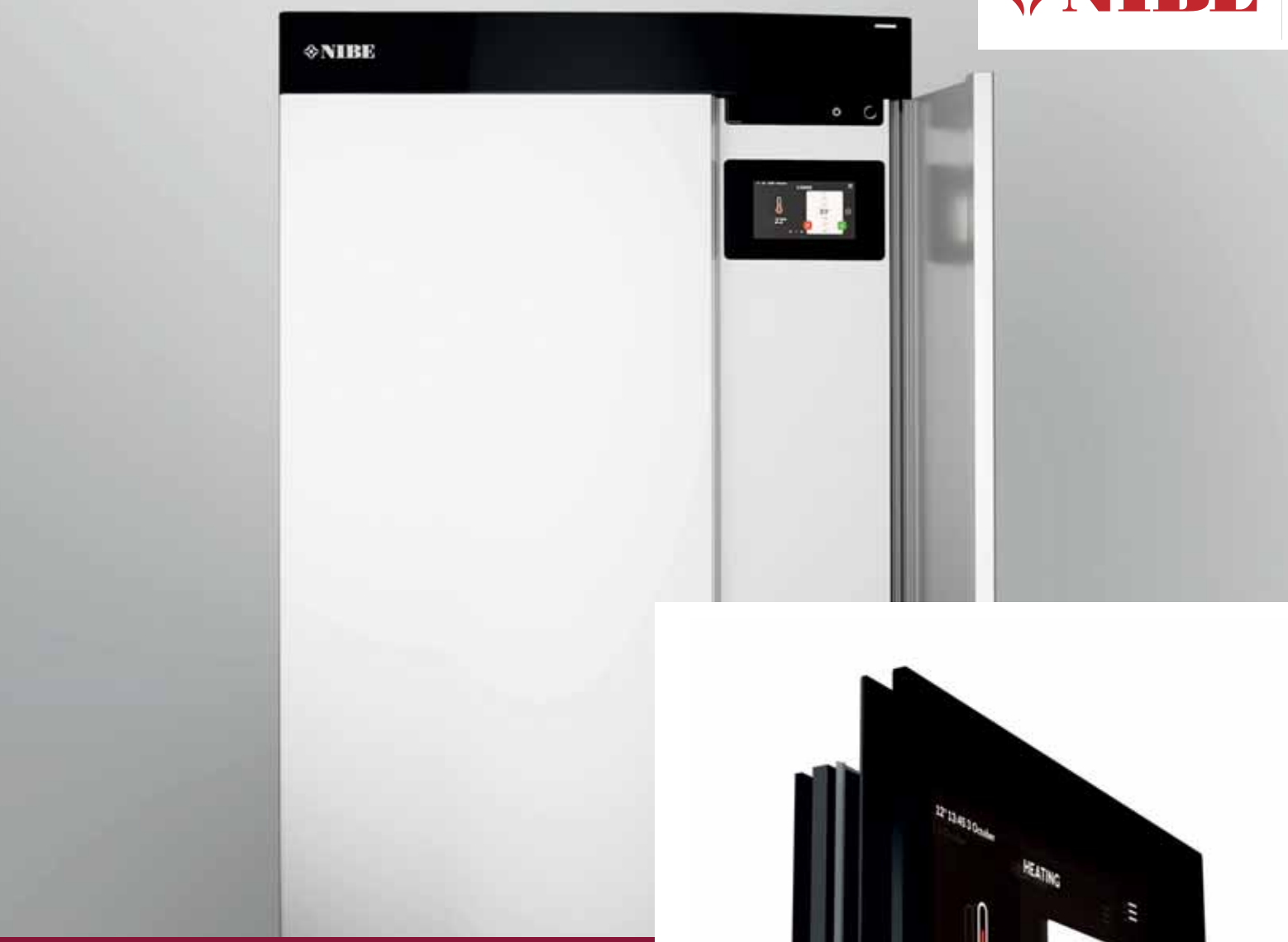

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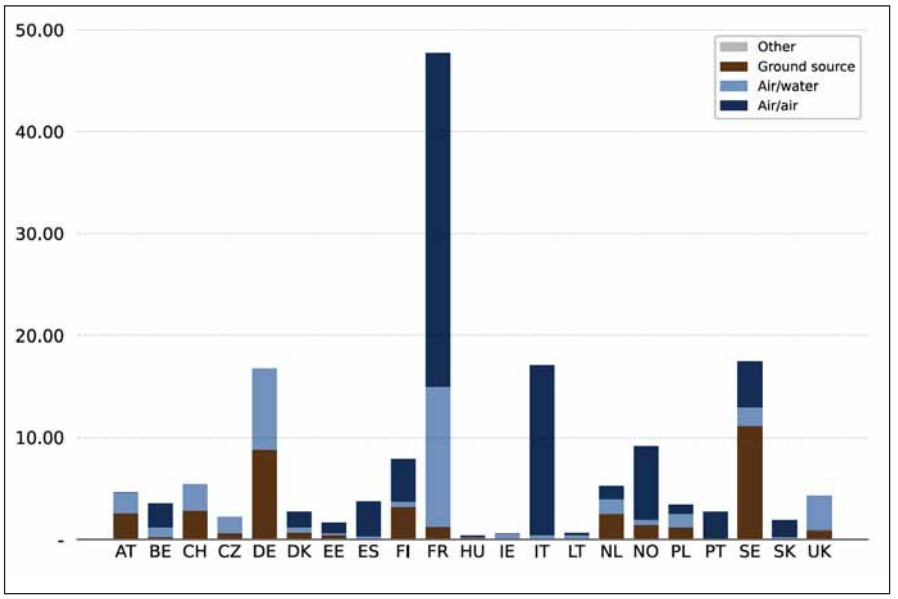

Figure 3: Renewable thermal energy provided per country, by type, 2020 (in TWh); "H-" indicates primary heating function.

regard to framework conditions, efficiency requirements for buildings, upskilling of installers and planner/architect qualification, as well as the introduction of flanking measures.

In aggregated terms, nearly 14.86 million heat pump units were installed since 1996. This amounts to an installed thermal capacity of 128.7GW. All installed heat pumps produce 252.6TWh of useful energy, 160.2TWh of which is renewable. Their use saved 204.8TWh of final and 93.11TWh of primary energy. Figure 2 shows the split of renewable energy production from heat pumps on a country level. France is the country that produces the most renewable energy, followed by Sweden, Germany and Italy. Figure 3 shows renewable thermal energy provided per country, by type, 2020 (in TWh); "H-" indicates primary heating function.

> Significant government intervention is necessary to shape the sustainable energy supply in all member states of the EU.

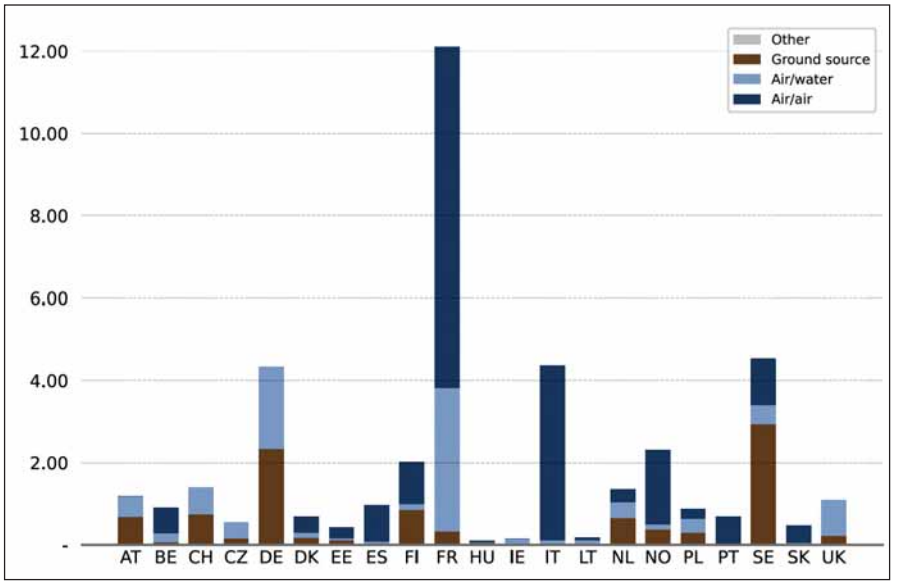

Figure 4: Greenhouse-gas emission savings based on sales 2020, per country (in Mt);"H-" indicates primary heating function.

Emission savings from stock

The heat pump stock in 2020 (heat pumps sold in the past 20 years) contributed 41.07Mt of greenhouse gas emission savings (see Figure 4). The distribution of emission savings per country is very similar to that of renewable energy production, since both calculations are directly linked to the number of units installed and the related reduction in demand for fossil energy. However, even the 14.4% growth achieved in 2020 is no more than a step in the right direction.The current growth rate of heat pump markets across Europe is insufficient to decarbonise heating and cooling by 2050. It needs brave government decision-makers to address the elephant in the room: a distorted price mechanism that favours the use of fossil fuels and fossil fuel technology.

Instead of making the polluter pay for emissions by adding related cost to the price for fossil energy, most governments still support their use – directly or indirectly – and leave the cost of environmental damage of fossil fuel for society to pay. Latest figures show that 6.5% of the global GDP or $5.4trn are spent on fossil energy subsidies. A perceived cheap way of heating is actually paid for via other budgets, namely by health and environmental protection services.

The heat pump industry reiterates its call on decision-makers in the European Commission and the member states to address this issue. Heating and cooling industries need to decarbonise over the next 30 years. This is a tremendous challenge that needs to be started as soon as possible. The benefits of heat pumps make this technology a prime candidate for a central role in a sustainable European energy system. Clearly then, today's business as usual will not be enough to unearth the technology's potential. Instead, significant government intervention is necessary to shape the sustainable energy supply in all member states of the EU. ■

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Underfloor heating

System design critical to successful installation

Above: Without radiators on key walls, the freedom to plan a room to suit the occupants means other features can be designed in, such as bi-fold doors and a complete freedom to place furniture where it is required.

With the push towards low-temperature heating systems in both new-build and retrofit, heating system design needs to be considered carefully to make best use of this low carbon heat, *writes Kevin Ray (right), Head of Heating & Ventilation, BEAMA and Manager of the BEAMA Underfloor Heating Group.*

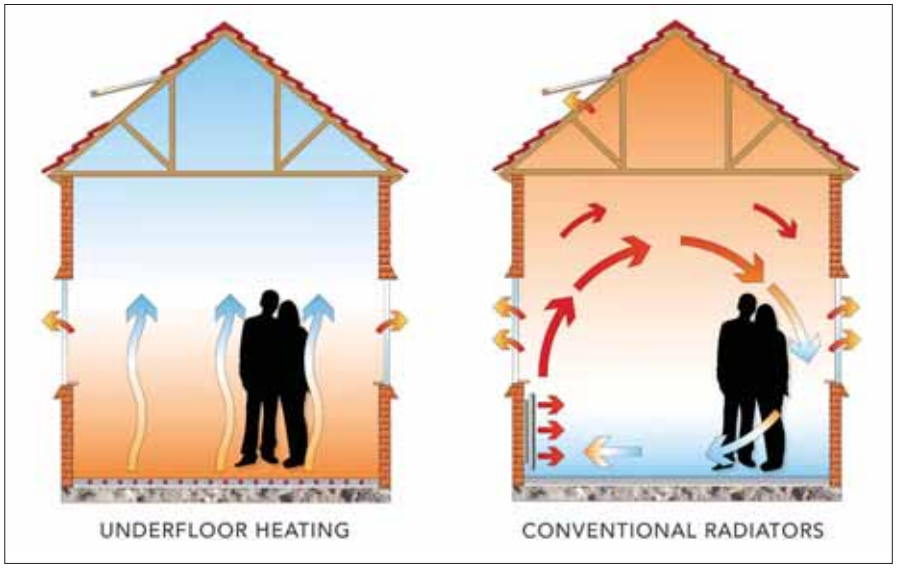
Ray has worked directly with this industry group for the last three years and, prior to that, spent 11 years as Sales Engineering Manager responsible for technical support of the heating controls and valves of a major manufacturer. In this article he aims to remove some of the myths surrounding underfloor heating installation, and to make the choice of underfloor heating an easier one for customer and installer alike.

Heat pumps make an obvious choice, especially given the drive to electrification and zero carbon targets. Heat pumps are more efficient, ie, the Coefficient Of Performance (COP) improves with lower flow temperatures. Due to the large emitter surface of an underfloor system, it is also at its best with low flow temperatures, and as low as 35°C is possible. Underfloor heating, therefore, makes a seamless partner for these lower temperature heating systems.

Underfloor heating is also an attractive proposition for the consumer, offering improved comfort levels without hot or cold spots, more space without intrusive radiators, improved air quality with lower dust circulation, and a safer environment without the high temperatures of radiators. Underfloor heating is also regarded as a desirable luxury and can often increase house valuations.

Underfloor heating has many myths, often a poor installation experience can cloud the decision to use it and installers and specifiers should feel supported from initial design through construction to deliver the best possible system and efficiency. Underfloor heating has been successfully in use for many years and installers should be confident that installations can be hassle-free if the correct guidance is followed and reliable and trusted suppliers are used.

The BEAMA Underfloor Heating Group is the trade association for underfloor heating manufacturers and designers. It represents all the major manufactures and aims to improve the training and quality of installs across the industry. Members undertake to provide the highest levels of technical support to customers, including providing bespoke system designs and installation guidance with many also offering product training.



Underfloor Heating provides a more natural and comfortable heat within a room. With a less aggressive heat output from a much larger radiant area, the warmth in an underfloor heated room is more comfortable for the occupants and less prone to staying at ceiling level.

Specifying or installing underfloor heating is not to be feared. There are systems for new-build and systems for retrofitting older properties. There are screed systems and overlays of various thicknesses. All can be applied easily to ground or upper floors. But the process must start with proper design of the system, which all reputable suppliers normally offer free of charge.

Underfloor heating system design starts with room-by-room heat loss calculations for the property. This will enable the system to be designed around the following:

- Heat losses of each room;
- Floor construction;
- Foor covering to be used;
- Customer's desired room temperatures;
- Heat source to be used.

This calculation will determine the correct sizing of the heat source for the property, and then lead on to an optimum room-by-room pipe layout design for the underfloor system. Pipe sizes and loop lengths will be specified, as will the setting up and commissioning details such as the flow rates in each loop and the water temperature. As previously mentioned, this design phase can be provided by the suppliers of the materials, and very often in conjunction with an engineer or the installer.

It is important that the design is then followed and commissioned to the specification provided to enable the system to run at its maximum efficiency. This will involve adjusting the flow rates through the heating loops in each room and setting the flow temperature to the manifold.

It is always worthwhile working closely with the homeowner, discussing and determining their requirements. Floor coverings can affect the output of the floor and need to be considered at the earliest stage in the design.

> Underfloor heating has been successfully in use for many years and installers should be confident that installations can be hassle-free if the correct guidance is followed and reliable and trusted suppliers are used.

Despite some misconceptions, most floor coverings can be used. A ceramic tiled or hard floor is possibly the most common but wooden floors and carpets can also be factored into the design with no impact on the comfort. This just needs consideration in the initial design and possibly the use of floor sensors to avoid overheating say on natural wood floors.

Underfloor heating manufacturers are constantly developing their products to improve the performance or to make installation easier. There are many low-profile systems developed that allow easy installation over existing floor types with minimal increase in floor height. These are ideally used in retrofit or on upper floors over joists. They make installation simpler and also have faster response times. Discussing the application with the supplier will enable the best solution to be selected.

The handover to the customer is also an important area that needs to be allocated time in the installation process. Demonstrating the use of the controls, as these may be unfamiliar to the user, and setting up the initial heating profile, should both be a part of the handover process. This should include discussing the merits of setting constant temperatures instead of setting the system to switch on and off. This will enable the user to confidently operate the system at its maximum efficiency (and therefore lowest bills) without needing to seek further guidance.

Following the successful installation and commissioning, underfloor heating will have lower overall maintenance requirements. An annual check and system service are probably all that is required. Most pipe systems offered by BEAMA members are covered by extensive guarantees, some up to 75 years, so installers can have peace of mind that components used will still be working many years after installation.

For more information see: https://www.beama.org.uk/portfolios/underfloor-heating1.html ■

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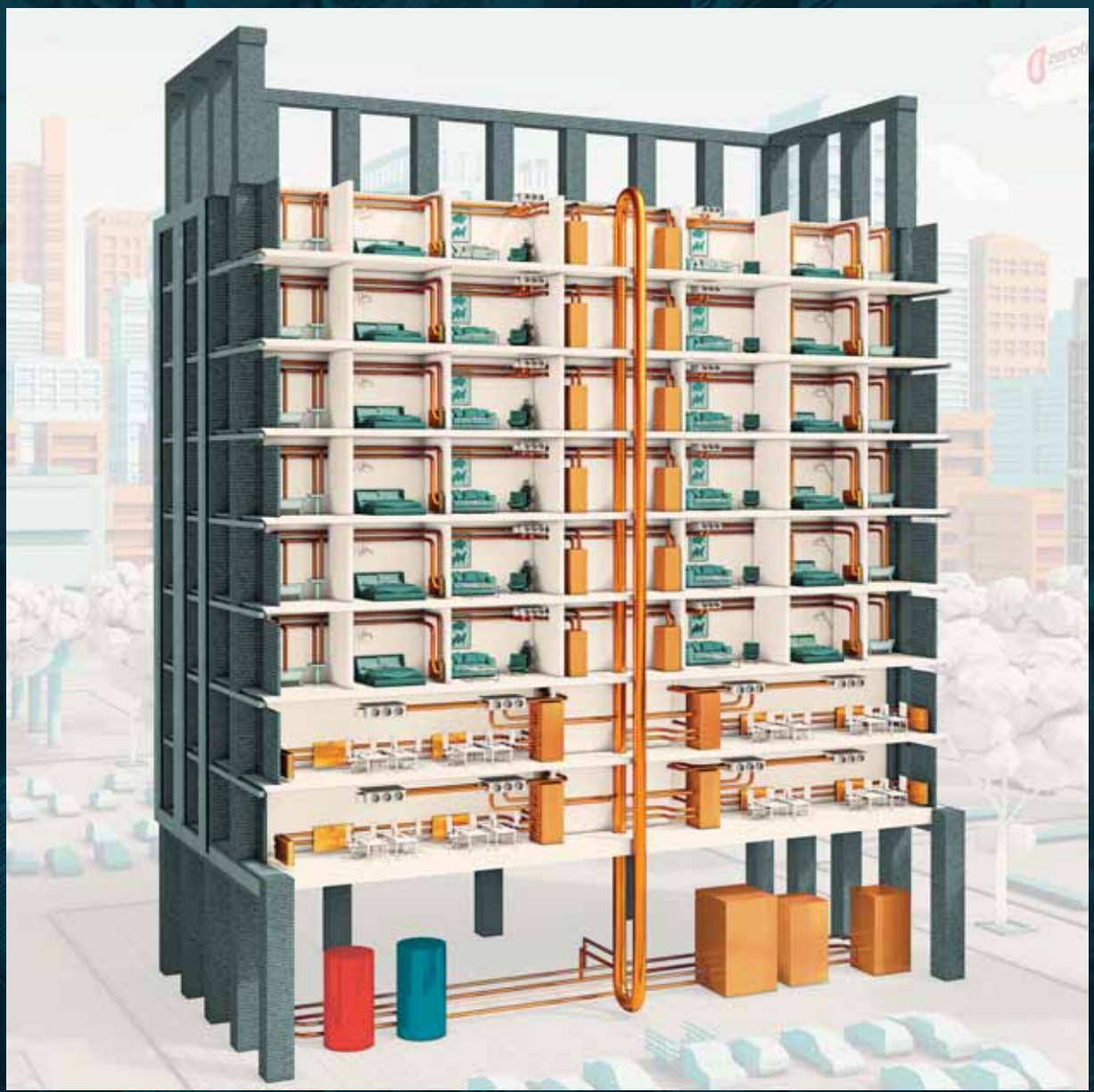

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LG Therma V R-32 green solution

The LG Therma V from Unitherm Heating Systems is an air to water heat pump (AWHP) that provides heating, cooling and hot water. As the indoor and outdoor unit are combined in one module, this monobloc system makes the transportation and installation much easier. There is no additional refrigerant piping required.

The LG Therma V R32 monobloc heat pump system

Therma V is also very simple to set up and its uncomplicated layout and continuous operation-tracking make maintenance relatively quick and painless. It only takes the removal of three screws to access the water pump and strainer, while the data-logging feature makes it easy to check operation history and locate the source of any issues.

Another key feature is the LG Therma V Configurator. This software allows the installer enter a range of project-specific information to get a clear picture of what needs to be done before arriving on site. It not only makes preparing for installation a straightforward matter, it also presents clients with an easy-to-understand overview of the set-up process, letting them know what to expect.

That said, installation flexibility and performance count for very little if the system cannot meet green energy targets. Therma V comes equipped with LG's inverter technology which enhances energy efficiency without sacrificing operational capabilities. The inverter reduces energy consumption with its ability to vary output as needed, rather than simply being "on or off" like conventional setups. In addition, the Therma V's BLDC fan motor offers greater energy savings – up to 40% at low speeds and 20% when running at higher speeds (compared to an AC motor). It also means reduced CO2 emissions.

Pre-installation setting – Based on site information, installers can prepare pre-setting with LG Heating Configurator and save data into a memory card in the office. At the site they simply insert the memory card at the back of the remote controller to activate configuration data.

A key strength of LG's Therma V monobloc line-up is that all models feature the innovative, eco-friendly R32 refrigerant. The outstanding performance of these new units is also evidenced by a 4.45 Seasonal Coefficient of Performance (SCOP) in heating operation and an A+++ Energy-related Product (ErP) label.

The LATS (LG Air Conditioner Technical Solution) incorporated in Therma V can run detailed simulations that clearly illustrate its economic benefits, giving clients an accurate estimate of how much they can cut energy costs. Installers can specify a number of parameters, which the program then uses to calculate annual energy costs (compared to a conventional heating system); annual CO2 production; monthly energy usage and corresponding cost; and the total amount of thermal energy usage (in kWh) as the outside temperature changes over the course of the year.

LG's Therma V is designed to exceed everyone's expectations, introducing simple installation and maintenance with eco-friendliness and superior energy efficiency. These strengths, coupled with the technical backup and experience Unitherm Heating Systems, makes for a formidable partnership and offers significant benefits for installers and end-users alike.

Contact: Unitherm Heating Systems. T: 01 – 610 9153 (Dublin Office); 021 – 441 4010 (Cork Office): 091 – 380 038 (Galway Office). E: info@unithermhs.ie ■

Grant invests over €250k in biofuel R&D breakthrough

Grant, Ireland's leading heating appliance manufacturer, has invested over €250,000 in pioneering a major R&D breakthrough that could help reduce carbon emissions in rural and hard to heat properties. Over the past six years the Grant R&D team has worked with third level institutions, industry partners and renewable fuel producers, focusing on more sustainable and carbon-saving fuels and innovating its boilers to be biofuel compatible.

Commenting on the R&D project, founder Stephen Grant said: "In the early days of our research, we identified potential bio and synthetic fuels that would both meet greenhouse gas reduction targets and be commercially viable. This began with developing a boiler that could use a biofuel called FAME (fatty acid methyl esters). Our team successfully used a 30% blend of FAME with regular kerosene, although problems arose when the blend of biofuel exceeded 30%. This resulted in increased NOx emissions, issues with fuel storage stability and more rapid aging or poor performance in cold conditions.

"The breakthrough came during testing and field trialling with boilers successfully using 100% biofuel known as hydrotreated vegetable oil (HVO). HVO feedstocks are generally rapeseed oil, sunflower oil, soybean oil, certified sustainable palm oil and non-food oils such as jatropha oil and algae oil, in addition to waste animal fats. Even more sustainable are waste and residue oils, both of which are now a substantial contributor to the feedstock," added Stephen.

While HVO is a relatively new fuel to Ireland (current distributors include Nicholl Oil in Carryduff, Co Down and Inver Energy in Blackpool, Co Cork), in Europe and the UK it is used for marine and public transport and to power generators.

Stephen comments: "The use of 100% HVO can result in around an 88% reduction in carbon emissions and, using this or a percentage blend of HVO with kerosene, will enable rural and hard to heat Irish properties to transition to a renewable green alternative from 100% kerosene, at an affordable cost, with minimum disruption to everyday home living.

"All new Grant condensing boilers are future-proofed to use HVO by making a slight modification to the boiler. Older Grant condensing boilers can also be adapted to HVO, and the modifications needed can be carried out by a service engineer during an annual service.

"One very important benefit of HVO to the Irish construction industry is that builders and relevant trades can continue to focus on building new houses in large numbers without being diverted to slow and costly deep retrofitting projects, enabling more heat pumps to be fitted."

Later this year Grant will introduce a service engineer biofuel conversion course through its eLearning Academy. This will cover a basic introduction to HVO, including the necessary steps required to convert boilers to run on this biofuel, and is open to qualified service engineers and technicians.

Visit www.grant.eu for more information on Grant's range of innovative heating solutions and R&D breakthrough. Follow Grant on Facebook and Twitter @GrantIRL or Instagram @Grant_IRL. ■

Founder Stephen Grant pictured in the warehouse of the company's headquarters in Birr, Co Offaly. Inset: All new Grant condensing boilers are future-proofed to use HVO.

Heat on for a future with energy-efficient HVAC solutions

In 2017, the average Irish dwelling emitted almost twice the energy-related carbon dioxide emissions as its average EU counterpart. That statistic sits in stark contrast to the Government's commitment to reduce emissions by 51% by 2030, and to achieve carbon neutrality by 2050, *writes Kevin Devine, Sales Director, Xylem Water Solutions, Ireland.*

"How we live and how we build are central to our commitment to reducing carbon emissions and delivering on targets outlined in the Government's Climate Action Plan," said the SEAI, explaining heating's role in the proposed shift. The country's "relatively cold and damp building stock" often lacks insulation and, due to a historic reliance on imported oil and gas, tends to be heated using high-carbon fuels including oil, coal and peat.

"Eliminating energy waste and transitioning away from fossil fuels for heating poses a significant challenge for our society," said the SEAI.

Yet, while Ireland may have a bigger hill to climb than others, the challenge is certainly not insurmountable.

Traditionally an area with considerable power consumption, the latest HVAC market additions can in fact reduce energy usage by up 80%. New "smart" circulators designed for water circulation in heating, air conditioning and domestic hot water systems can be used for either the refurbishment or extension of existing systems, or for facilities fitted with thermostatic valves. They are equally suitable for single-family houses or apartment buildings, and with underfloor heating systems.

The latest HVAC market additions can reduce energy usage in buildings by up 80%.

Thanks to an ECM motor with intelligent speed control capable of adjusting according to real-time need, they offer best-in-class energy efficiency that's fit for the future.

The latest thermal energy metering products offer continuous insights into the thermal network, helping to reduce energy consumption and heating bills by building awareness and driving behaviour change.

Metering solutions include both mechanical and static sensing heat meters, with multiple comms and control options that can support data streaming as part of building automation or monitoring systems.

Xylem's products can be used with a range of alternative heating technologies as we look to renewable sources that will form the basis of a more sustainable future. Whether it's district heating, solar-powered heating, geothermal energy or heat interface units, there is a smart solution capable of reducing energy usage in line with the latest directives.

Historically, oversized heating systems have led to inefficient operation and energy wastage. This is unsurprising given that half the building stock in most European countries was built before the first thermal regulations in 1970.

Upgrading existing buildings and systems with state-of-the-art HVAC systems and installing the most effective HVAC systems possible in new buildings will form the basis of a greener, cleaner future.

As well as investing in efficient products and correctly sizing the system, monitoring and control via the latest smart systems can allow for further energy savings according to real-time information, and keep heating systems operating at maximum energy efficiency.

For more information on smart, scalable, modular heating and cooling technology, visit www.xylem.com/en-ie ■

Innovative UFH system from Unipipe perfect for upper floors

The unique Ideal Classic NEO 20 underfloor heating system from Unipipe is designed to be installed without the use of wet screed and, at just 20mm high, is ideal for use upstairs in timber floors and in homes with engineered joists. The underfloor heating pipework is fitted into shallow pre-engineered EPS boards, with an aluminium coating that helps to transfer heat optimally into the floor finish above.

The Ideal Classic NEO 20 system is an adaptation of the established Ideal Classic EPS 30 devised by renowned German manufacturer MFH. The advantage of the latest version is that the installation height is reduced by 10mm, while a 16mm heating pipe is still used, meaning that the heat output and pressure loss remain identical.

The system elements are laid according to the usual, simple principle of the MFH Ideal system. The 0.5mm thick aluminium heat-conducting sheets are already attached to the NEOPOR and the pipe channels have an omega shape to optimally fix the 16mm pipe. Floor coverings can be laid (almost) directly on the heating elements.

Ideal Classic NEO 20 can be combined with all common screeds and is particularly suitable for drywall construction. In combination with innovative heat-conducting layers, a high level of heat output is achieved and rapid heating up and down is possible, making it particularly energy-efficient.

"These underfloor heating systems are ideal for new-build or retrofit," says Paul O'Donnell, Managing Director, Unipipe, "and challenge the misconception that underfloor heating is too awkward and difficult to install on the first floor and above. Apart from the comfort and performance levels, it also offers a solution for those who don't want radiators cluttering up wall space.

"We also supply a strong, 5mm board made from recycled materials which, when placed over the MFH 20mm boards, can then take ceramic tiles. This solution is ideal for apartments and also offers the added benefit of sound-proofing the floors."

Features and benefits

- Easy-to-install with a low installation height;
- An installation height of 40mm, including flooring, is possible with CompactFloor;
- The 16mm pipe can also be used at a low height;
- Technically compatible with the Ideal Classic EPS 30;
- Flexibility and efficiency in one system.

Contact: Unipipe Ireland Ltd. T: 01 – 286 4888; E: info@unipipe.ie; www.unipipe.ie ■

Despite the low installation heights, Ideal Classic 20 still delivers optimum performance and is ready for tiles or other floorcovering when the 5mm board is placed over the MFH 20mm boards.

Pumps can be used to balance a heating system quickly and accurately.

What to do about noise in heating systems

Noise in a heating system is a well-known issue for installers. The noise can come from the pump, the pipes or the radiator thermostats – and it can be caused by either the mechanical parts of the system, air in the system, or the water or fluid in the system. Since hydronic systems easily transport the noise, it can be difficult for the installer to know exactly where the noise is coming from.

In general, there are two main causes of noise in heating systems – wrong or incorrect commissioning and wrong dimensioning.

Noise due to incorrect commissioning

In many cases, the noise problems are caused by the system operating at too high a speed, resulting in a higher flow than is needed. When this happens, it forces the valves to compensate by trying to close, causing friction in the system which can create noise.

Another cause is lack of balancing or wrong commissioning of the entire heating system, creating uneven flow and pressure across the system. This causes high stress in some parts of the system and results in noise from radiator valves.

Noise due to wrong dimensioning

A common reason for noise in heating systems is incorrect dimensioning of the system parts. If the pipes are not sufficiently dimensioned according to the needed flow, it can create friction noise in the pipes and valves.

Other common causes of noise

Air in the system, resonance noises, cavitation noise and deposit build-up are other causes that can create noise in the system.

How to avoid noise in a system

Correct selection, sizing and commissioning of the pump, including correct selection of pump settings with automatic adaptation (AUTOADAPT), ensures the differential pressure will not exceed the normally needed level. A balanced system will remove any uneven flow and pressure across the heating system, minimising the risk of noise when heat demand changes during the year.

Grundfos lab tested

Grundfos circulators are tested in Grundfos' own sound laboratory. In the sound lab the circulators undergo very comprehensive noise tests with the focus on the noise emitted through air, water and the piping structure. Grundfos strives to make its pumps as quiet as possible but, no matter how well-tested these components are, it is impossible to fully replicate the diversity of real installations. This means that installers should play a crucial role in designing, dimensioning and commissioning heating systems correctly.

When the system is noiseless, it often means it is running optimally and the homeowner is ensured full comfort and optimal energy consumption throughout the entire heating system. This also means less call-backs for the installer.

For further information visit www.grundfos.ie or contact salesireland@sales.grundfos.com

Altherma 3 H HT sets new industry standard

Fresh from an extensive series of very successful online installation and CPD presentations over the last 18 months, Daikin is now embarking on a further training programme that will involve a hybrid mix of both online and face-to-face training modules. Now that Covid-related restrictions are easing, there is a significant appetite for a return to the practical, hands-on training/education format.

Consequently, Daikin are currently in the process of opening four dedicated Sustainable Home Centres – one each in Cork, Galway, the Metac facility in Mountrath, and its own newly-revamped centre in Citywest, Co Dublin, with more to be rolled out before the end of the year. The intention is to use these facilities both as showrooms and training venues, and to host events in them in conjunction with their merchant and dealer partners.

Speaking with *Building Services Engineering* recently Shane McCarthy, Heating Sales Manager of Daikin Ireland, said: "We were overwhelmed, and indeed extremely encouraged, over the last 18 months or so at the response we got to our online training programme. There is no doubt that installers and engineers availed of the opportunity to both upskill and increase their knowledge base, and this will now feed into the quality of heating installations as we go forward. "Now that we can again meet face-to-face, the demand for training has, if anything, increased. Hence our development of regional Sustainable Home Centres, strategically located throughout the country, so both installers and engineers can easily access modules on the programme. The primary areas covered are installation, commissioning, fault-finding and servicing. We can also devise tailored programmes where requested."

Altherma 3 H HT high-temperature air-to-water heat pump for heating, cooling and domestic hot water.

With home energy upgrades becoming increasingly prevalent in Ireland, Daikin are committed to developing installers and engineers and believe that, with its new training initiative of "train together, grow together", renewable industry will continue to expand.

Along with installer development, Daikin are continuing to introduce cutting-edge products designed for both new builds and home energy upgrades. In fact, one of the latest made available is the Daikin Altherma 3 H HT heat pump. This high temperature air-to-water heat pump delivers 65°C leaving water temperature and can provide heating, cooling and instant hot water, while using less energy. It has been designed for homeowners who want to upgrade their boiler or traditional heating system to a greener and more cost-effective solution.

Apart from performance excellence and energy and carbon-reducing features, Daikin's Altherma 3 H HT is the first Daikin outdoor unit with a distinctive new design. The black front horizontal grill makes the fan invisible inside, while the matt grey casing blends in discreetly with the surrounding architecture.

Another unique feature is that Daikin Altherma 3 H HT has been designed for lower acoustic levels to offer siting flexibility and meet the needs of urban areas. In "standard sound" mode, the unit produces a sound pressure of 38 dBA at three metres. In "low sound" mode this reduces even further by 3 dB(A) so at three metres it is 35 dB(A).

In conclusion, McCarthy said: "The innovative features which are now incorporated into the new Altherma 3 H HT models are indicative of the cutting-edge technology now being developed by Daikin and, once again, demonstrates our commitment to helping Ireland realise its carbon and energy reduction targets."

Contact: Daikin Ireland.
T: 01 – 642 3430; E: heating@daikin.ie

Coaxial heat exchanger sets Ideal apart

Part of the Groupe Atlantic family, the Atlantic A.I Extensa and Excellia heat pump models from Ideal Energy provide a dedicated hydraulic conception for improved performances with a COP of up to 4.52. The inverter control adapts its power supply according to the outside temperature to provide the exact amount of energy for a constant and economical heating system. This offers comfort to home-owners, whatever the weather, as well as huge savings on household energy bills. The Atlantic heat pump range is also extremely versatile and adaptable for siting flexibility, while its quality controls make the user interface experience seamless. On the interior the technology is patented and unrivalled.

The range benefits from the tried and tested coaxial heat exchanger, a technology developed and patented by Groupe Atlantic to maximise the performance of the heat pump. The coaxial heat exchanger is immersed in an internal buffer tank, allowing it to function without any filter trap or water flow controller, which makes the heat pump a reliable and efficient solution. This also benefits the installer as it is literally "plug-and-play", with no system preheating required. In addition, the coaxial heat exchanger is system-tolerant with the largest heat exchanger waterways on the market. This technology differentiates the unit from all other heat pumps using plate heat exchangers.

Looking at the two models individually, the Extensa A.I is the perfect all-round solution, producing DHW at 55°C. It comes in four models, with outputs ranging from 5kW to 10kW. All single phase, the heat pumps can work with outside temperatures from -20° to +35°.

Meanwhile, the Excellia A.I is the adaptable high-temperature solution in the range, with integrated DHW production at 60°C and a 190lt capacity storage tank included. Its design and range of accessories makes it the benchmark in the heating sector. It comes in two single phase models – 11kW and 14kW – and three models in the triple-phase option – 11kW, 14kW and 16kW. The heat pump is capable of working with outside temperatures as low as -25°C.

With a full range of accessories that cater for all applications, and the unique "Two Zone" kit that allows two different temperatures for radiators and underfloor to run at the same time, this system provides the installer with a compact, simple and cost-effective solution. The programmable controls are simple to use for the homeowner with the "Cosy Touch" app providing complete control. Total peace of mind is assured thanks to the market-leading 8-year product guarantee.

Contact: Ideal Energy.
T: 01 – 961 7700;
E: sales@idealenergy.ie ■

The Atlantic A.I Extensa and Excellia heat pump models from Ideal Energy high-performance solutions are both competitive and environmentally-friendly. They are designed for individual homes, collective housing, offices, shops, schools, airports, hospitals and many other commercial buildings.

Zeroth exempler installation as featured at the Glen Dimplex purpose-designed demonstration showroom at its Dunleer complex.

Comfortable "zero energy" living with Dimplex Zeroth system

For those who aspire to live in a modern city apartment, an unfortunate by-product of the desire for acres of glass and the need to reduce urban noise and exclude pollution are hot, stuffy living spaces.

The complexity and cost of incorporating both heating and cooling into a building's design will typically result in a premium price tag for an apartment's owner or tenant. Keeping a living space comfortable, warm or pleasantly cool should not be seen as a luxury, but as a basic requirement for living in any modern building.

With the inclusion of a Zeroth Energy System, making clever, cost-effective use of lower temperature water throughout the building, there is the assurance of a well-balanced and comfortably controlled temperature within each apartment and the communal areas. It also means the building is more environmentally friendly as it uses, and loses, less energy.

What is Zeroth?

The Zeroth Energy System provides heating, cooling and hot water services to residential or commercial spaces using a network of water-water heat pumps. The heat pumps are connected to an energy loop, which is a water circuit maintained at between 15°C and 25°C. The energy loop is maintained within operating parameters using centralised heating and a cooling plant. Apartment heat pumps are connected to a range of emitters, including fan coils, radiators, underfloor heating or fan convectors. Hot water is provided by a localised cylinder, charged by the heat pump.

How does Zeroth work?

The Zeroth Energy System offers an innovative approach to heating and cooling city apartments which is set to change the way we heat multi-occupancy residential buildings. By creating a series of "energy loops" within a new building, Zeroth replaces conventional high-temperature systems with a cool, low-pressure system, maintained by the building's central plant room.

Low-temperature water flows around the building's main loop to each apartment, all of which have their own "mini-loop" where an individual heat pump produces heated or chilled water to the occupier's desired temperature. The water can then be passed to fan coils which deliver warm or cold air into a room through vents in the ceiling or wall, or to underfloor heating, or smart electrical, fan-assisted radiators. It means more comfortable temperatures within apartments and reduced overheating in communal areas.

What is more, the cost of heating system losses is no longer spread across all residents, meaning each one only pays for the heating or cooling they use.

For more information on the Zeroth Energy System, or any of the Dimplex products, contact: Glen Dimplex Ireland. T: 01 - 842 4833; e: salesireland@glendimplex.com ■

Airfix Active for sanitisation, surface purification and air quality

SARS-CoV-2 is a big concern for many building and business owners as the country begins to open up in the wake of the pandemic. There are a vast number of different air cleaning and sanitisation units now on the market. Many contain the same technologies such as HEPA filters and UV-C lighting and it can be particularly tricky for potential users and specifiers to choose one that reduces transmission risks effectively.

Euro Gas has always been to the forefront in delivering innovative technologies and solutions to meet the various challenges faced by the building services engineering sector. So, now that Covid-19 has presented system designers and consultants with the daunting task of achieving and maintaining perfect air quality within buildings, it has once again risen to the challenge.

Working in partnership with Emicon, is has just introduced Airfix Active. This was designed to provide a high level of air filtration, surface purification and sanitisation for all indoor, medium-crowded, locations. It prevents contamination and minimises the diffusion of bacteria and viruses, including SARS-CoV-2.

Airfix Active incorporates photo-catalytic oxidation, a technology used for sanitisation in aerospace applications, mainly requiring a high-quality and healthy air. The oxidation reproduces a natural process called photocatalysis that, thanks to the reaction between solar UV radiations, air humidity and some natural metals in the environment, can eliminate most of the toxic and pollutant compounds in the air and on all surfaces. While extremely powerful, even with an airflow of 1600m3/h, the unit is very quiet due to its internal insulation and the dimensioning of the fan section.

Airfix Active houses staged filters to provide a level of sanitisation of more than 99.95pc effectiveness. The first stage is a re-usable double containment coarse mesh pre-filter on the air suction side at the bottom of the unit in order to trap dirt and dust. The second uses an ePM1 filter with a wide filtering surface, used as clean air pre-filtration. Finally, the third stage is a HEPA 13 filter (or HEPA 14, as an option) positioned before the fan section. The unit achieves a very low-pressure drop which also means compensatory airflow into the space is not required.

Contact: Euro Gas. T: 01 – 286 8244; E: sales@eurogas.ie; www.eurogas.ie ■

Due to the sleek design and vertical frame, the Airfix Active is suitable for any application and location.

Electrical safety for gas boilers

When installers do their training, of course they learn all about handling gas properly and safely. However, very few installers learn any more than basic electrics – just enough for them to be able to install a boiler. So, when it comes to servicing or repairing a boiler, there's a general lack of awareness when it comes to electrical safety. Here, Damian Delaney, Technical Support Manager, Baxi Potterton Myson, advices installers on how best to ensure that boilers are safe to work on during maintenance visits.

In our experience, most installers are not qualified electricians, and the few that are have not necessarily had training to understand the electrics of boilers. In addition, while there are industry-recommended tests, not all electrical tests are part of legislation but are rather seen as industry "best practice". Combine that with the prohibitive cost of the complete range of electrical testing equipment, and the fact that even if they had the equipment installers would not necessarily know how to use it properly or what it's telling them, and there's a high potential for things to go wrong.

At Baxi we show installers how to use a range of electrical testing equipment when they attend our training courses, including non-contact voltage indicators; multimeters; earth loop impedance testers; voltage sticks; voltage indicators and proving units. However, most of the tests needed could be carried out with a multimeter, so it is crucial installers understand how to use one of these properly.

We have heard of installers on site discovering, after receiving an electric shock, that a poorly-installed boiler has left the pipework and boiler casing "live". According to the Health and Safety Authority, there have been 40 deaths by electrocution in Ireland between 2001 and 2020, most of which were associated with work activities. At least one was caused by "plumbing in a kitchen". Apart from fatalities, there are no details about how many "near misses" there have been.

One shock, however small, is too many so we make no apologies for preaching about electrical safety on our training courses. We show installers how to carry out the following tests:

- *Safe isolation* – Before even touching the boiler, make sure the boiler case isn't live by using a no-contact voltage indicator;
- *Earth loop impedance tester to check for adequate earth* – Boilers in standard properties will pass if the reading is less than 1 Ohm impedance. Older properties with cruder systems have a bigger allowance;
- *Fundamental checks* – Carry out basic electrical safety checks to make sure the boiler is earthed, has no short circuits, and has been wired up the right way around.

Section 6 – Gas and Electrical Considerations – of the Technical Guidance Document for Registered Gas Installers (http://www.rgii.ie/technical-information/technical-guidance-document.7195.html) also provides detailed guidelines regarding electrics when working with gas appliances.

It probably takes longer to read about these tests than to carry them out, and it should become a habit for every installer to do them before they start work on a boiler. Find out more about our specialist courses at http://trade.baxi.co.uk/trade-area/training/training-courses.htm

Understanding how to carry out electrical tests can make fault-finding much easier, and give installers the chance to set themselves apart from their competitors. More importantly, it can save them from getting any nasty shocks – or worse!

See www.baxipottertonmyson.ie ■

Carrying out electrical safety checks before tackling any boiler maintenance should be second nature to heating installers.

Major cost savings of fabric air dispersion systems

The renowned FabricAir® range of air dispersion systems is now available from Core Air Conditioning Ireland Ltd. Solutions can be devised for any type of project, even where air distribution without noise or draughts is essential. Using FabricAir systems also offers design flexibility and significant savings in installation and operational costs.

Difference between air socks, sox and fabric ducting?

The simple answer is nothing. A sock is a ventilation duct created in fabric instead of sheet metal or pvc pipe. The technology is widely used throughout the world, and so, is a technology with many names.

Regardless of what term is used, fabric ductwork has unique technological characteristics that set it apart from steel ducts, spiro ducts and other HVAC ducts in sheet metal. It can be used anywhere exposed ductwork is applicable.

In addition, the cost of a ventilation system in metal is typically five times as high as the price of an air sock solution. Thus, the savings potential in switching from metal to fabric is huge.

Advantages of fabric over metal

Condensation is quite a common concern in HVAC ducting. However, socks do not have the same natural tendency toward sweating as other HVAC ducts do. Permeable textiles prevent the formation of ductwork condensation, which is why fabric ducting does not require insulation.

Eliminating the need for insulation provides significant time savings on a project that also impact the price. The savings potential also includes materials and the transportation and storage of these during the building project.

A textile-based ventilation solution fits into just a few boxes rather than the truck loads of materials required to create a metal duct solution. This also means reduced shipping costs.

Fabric air dispersion solutions are made from fireproof materials and all FabricAir textiles are UL certified. Fabric ducts can even be made from non-combustible fiberglass.

A hygiene advantage of fabric ducts is the elimination of condensation, which in turn prevents bacteria, microbial growth and mould. Sox, like regular socks, can be machine-washed if they get dirty; some textile ducts can even be autoclaved. That cannot be done with conventional ventilation ducting.

Finally, fabric ductwork offers unique sound-suppression properties. Thus, air socks are the better alternative in noise-sensitive applications such as theatres and libraries.

FabricAir installation in a challenging indoor aquatic environment. In addition to performance excellence, it also adds an aesthetic feature and, in this instance, provided branding opportunities.

Cost-saving features

Air socks do not require accessories such as grilles or diffusers because the air dispersion happens throughout the length and circumference of the entire ductwork. Its lightweight nature and flexibility means it is easier to install than steel ducts, spiral ducts and stock pipe, or even pvc pipes, fiberglass duct board panels and aluminium ducts. The ease of installation means significant savings on the man-hours involved in the installation process, so the overall project cost is reduced.

FabricAir dispersion technology also enables energy savings of up to 40% on the running costs of the system due to the minimal internal pressure losses. A conventional metal duct solution requires balancing and sometimes on-site attenuation, insulation and painting. Fabric ducts are "plug-and-play" solutions that do not require any of these on-site adjustments.

Air sock systems are made-to-measure and ready to use straight from the shipping box. The "add on" effect of fabric ducting is that, due to its minimal pressure drop, AHU selection is smaller and less expensive because of the reduced total static pressures in the system.

Contact: Core Air Conditioning Ireland's HVAC sales team – Sean Gorry or Carol Malone. T: 01 - 409 8912; E: carol@coreac.com; sean@coreac.com ■

LIGHTING

IEC environmental standardisation for lighting products

The International Electrotechnical Commission (IEC) now has an advisory group working on environmental standardisation for lighting products. An update on this initiative was featured in a recent LightingEurope "Brussels Direct" webinar, presented by Bryan King, the convenor of IEC TC 34 Lighting Committee, Advisory Group 20. This webinar gave an insight into the IEC project, and explained why environmental standardisation action is needed for lighting products. The key points of Bryan King's address are summarised here.

The driving force for change is mainly the upcoming European Commission Single Lighting Regulation (SLR). This is not only a European matter, as many rest-of-world countries are also considering EC SLR-like regulation. Additionally, clear guidelines and methods are needed for organisations aiming to meet commitments to the UN Sustainable Development Goals, in particular SDG 12 Responsible Consumption and Production.

There are many IEC and ISO guidance publications on environmental matters but these are at the generalist level, not at the operating level, or specific to lighting products. The AG 20 Advisory Group is working on strategies so that "Relevant TC 34 publications will evolve to incorporate well-structured, clear and harmonised guidance and/or requirements on environmental aspects specific to lighting products".

Work initially started in 2019 with the formation of a one-year terminating IEC Ad Hoc Group which evolved into a permanent Advisory Group in 2021. This group has a diverse geographic mix of contributors with 16 lighting expert members spanning nine countries. The AG 20 workplan approach is to identify, collate and review guidance from existing IEC, ISO, EN and other environmental publications and to identify gaps in the current guidance relating to lighting products.

Bryan King is convenor of IEC Advisory Group AG 20 Environmental Aspects and is IEC TC 34 head of delegation New Zealand. He is member of one ISO and three Australia/New Zealand lighting committees. Bryan is Executive Director of industry association Lighting Council New Zealand, and Managing Director of New Zealand lighting consultancy Strategic Lighting Partners Ltd.

It is still early days, but the Advisory Group is forging linkages with other standards committees such as the IEC Advisory Committee on Environmental Aspects and IEC committee TC 111 Environmental standardisation for electrical and electronic products, and also with ISO committees TC 207 Environmental Management and TC 323 Circular Economy.

A significant source of input is from the work of the European Committee on Standardisation CEN/CENELEC JTC-10 joint committee on Material Efficiency Aspects for Ecodesign. This standards development work evolved from the European Commission under regulatory directive 2009/125/EC. The resultant EN 4555X series of eight environmental standards for "Energy Related Products" published in 2019 and 2020 are for guidance on extending product lifetime, the ability to re-use components and materials at end-of-life, and the use of re-used components and recycled materials. AG 20 is reviewing these JTC-10 Material Efficiency publications with a view to adapting them for lighting product applicability.

IEC pioneering work has recently been published by the switchgear

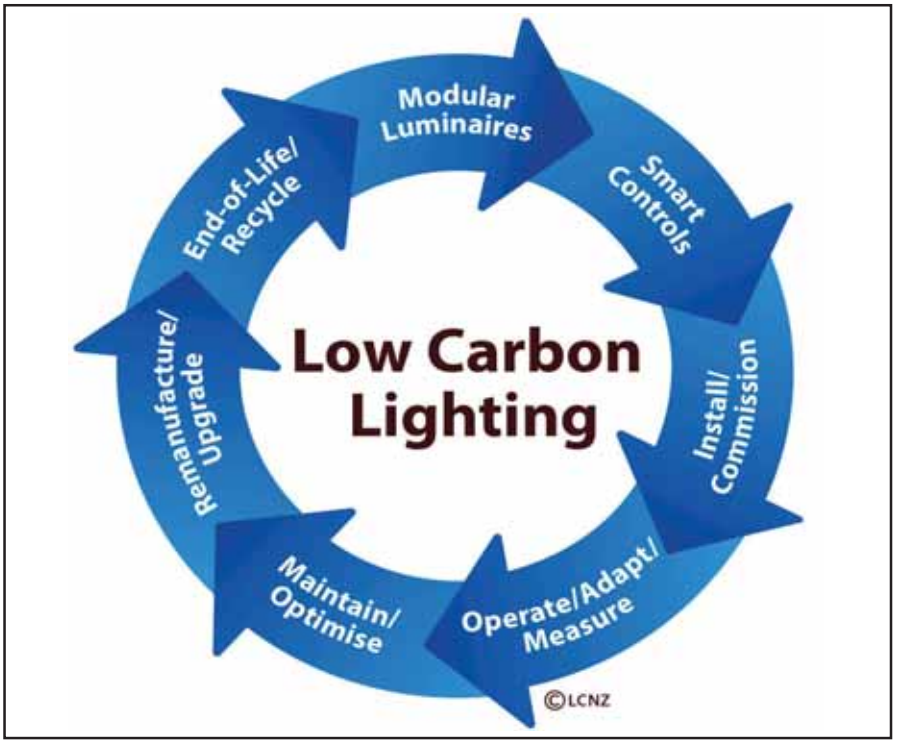
and controlgear committee IEC TC 121, with a product level environmental Technical Specification: IEC TS 63058 Ed1:2021 Switchgear and controlgear and their assemblies for low voltage – Environmental aspects. This was published in January 2021 and is the first IEC Technical Specification for environmental aspects at the product level. This publication is under evaluation by AG 20 as a potential model or template for a Technical Specification on environmental aspects for lighting products.

It is too early to judge at present what AG 20 outcomes will eventuate, but possible progressions from working group action could include the citation of a Technical Specification for lighting environmental requirements in lightsource, luminaire and controlgear "IEC Part-1 General Requirements" standards. Or alternatively, the embedding of particular clauses on environmental guidance and requirements into such standards.

Identified environmental information gaps for lighting products include specific life-cycle assessment (LCA) product and materials information, and life-cycle product category rules (PCRs) for the standardisation of lighting product environmental product declarations (EPDs). The development of such additional information will pave the way towards facilitating full building information modelling (BIM) optimisation with operational and embodied whole-of-life performance modelling.

International guidance

We have all often seen bold advertising claims for "green", "sustainable" or "eco" lamps and luminaires, without any evidence-based support. However, the era of loose and vaguely-expressed environmental generalities is over, with internationally standardised data now becoming an expectation for convincingly substantiating environmental performance claims. When developed, internationally standardised IEC guidance and methods will assist lighting with specific ways for defining, calculating and reporting of circular economy, materials efficiency, embodied and operational carbon emissions performance. ■



This "low carbon lighting" graphic was compiled by LCNZ to simplify the confusing internet morass of "eco stuff" diagrammes.

Vivares IoT light management system from LEDVANCE

Vivares is the new, future-proof IoT light management system from LEDVANCE that makes it easier than ever to produce the right lighting conditions for defined requirements. It offers simplicity with compatibility to two technologies – a wireless option via Vivares Zigbee and a wired version using Dali-2 technology. The flexible system is particularly suited for office solutions, especially where rewiring and structural changes are not possible.

Commenting on the range, Stevie Young, LEDVANCE Ireland, said: "Lighting today has to do so much more than simply switch on and off. Vivares enables new possibilities with sustainable, dynamic human centric lighting, and customisation. Major benefits for lighting professionals include simple and user-friendly installation, operation and maintenance. It is ideal for retrofitting existing buildings and for flexible office space solutions."

Based on the leading ZigBee 3.0 standard, Vivares adapts lighting to the most diverse requirements in the simplest possible way. Integrating daylight and motion sensors further increases the energy savings that can be achieved, while cloud-based monitoring with Vivares Cloud Services ensures even greater reliability and security by generating maintenance and energy consumption reports.

In addition, separation of lighting communication from Wi-Fi networks ensures maximum security. There are no control cables for unrestricted luminaire placement and the wireless system is scalable for major projects.

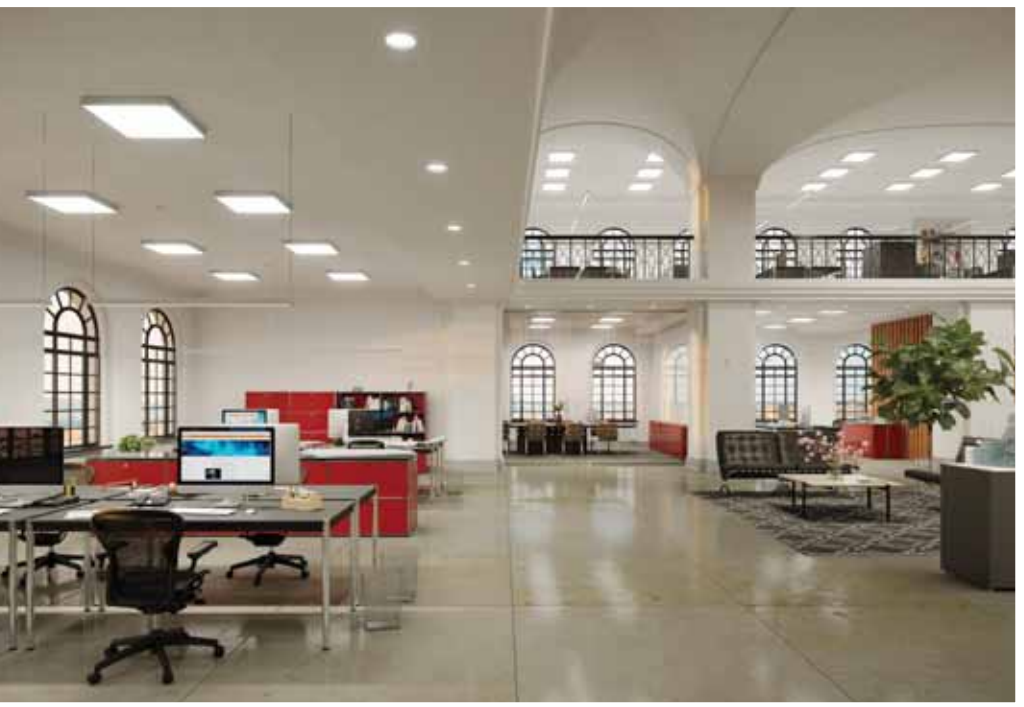
At the heart of LEDVANCE Vivares Dali is the Osram Dali Pro 2 IoT control unit. The system connects Dali-2 components, for example sensors, pushbutton couplers and the LEDVANCE Vivares Dali-2 luminaires. As an open standard, the system is compatible with a wide range of Dali-2-ready luminaires and components. A total of up to 128 luminaires and 126 input devices can be individually addressed via two channels.

Installation, configuration and commissioning are particularly simple and user-friendly thanks to the browser-based graphical user interface. Pre-defined templates and "drag and drop" enable time-saving and intuitive commissioning.

Another advantage of the Vivares system is the optional cloud services. Vivares cloud services for Vivares Zigbee and Vivares Dali offers convenient remote diagnosis of the system. With an intuitive dashboard the energy consumption, operating hours of the drivers and other relevant lighting data can be monitored. The various filter functions give users the option of analysing the data according to their needs, and this allows potential savings to be maximised.

LEDVANCE lighting solutions come in environment-friendly cardboard packaging with all relevant product information immediately visible on the outside of the box.

Contact: Stevie Young, LEDVANCE Ireland. T: 086 – 600 1291;
E: s.young@ledvance.com



The new Vivares portfolio offers new possibilities with compatibility to two technologies – a wireless option via Vivares Zigbee and a wired version using Dali-2 technology.

THE OBTUSE ANGLE

PAT LEHANE

Congratulations Fergus

Fergus Daly, a long-standing and prominent figure in the building services sector, has been appointed Sales Director of Hoctor Refrigeration Services. Fergus has held a number of senior posts with some of the leading multi-nationals in the industry and this will undoubtedly serve him well in his new role.

Hoctor Refrigeration Services was established in 1981 and company founder and Managing Director Liam Hoctor has built a thriving and very successful business over the last 30 years. The arrival of Fergus signals a new chapter in the annals of the company.

60 years young

No, not me, but *Building Services Engineering*. This issue is Volume: 60, No: 5, making it the fifth edition in this, our 60th year of continuous publication. Apart from our own website, every issue – from April 1961 – can be downloaded in pdf format at https://arrow.tudublin.ie/bsn/

What do I know?

Can't quite figure this one out. Apparently, the Hassyan "clean" coal power station in Dubai is designed to support the Dubai Clean Energy Strategy 2050. Back-up fuel? Nat gas.

Swine before pearls?

While I fully recognise the need for detailed market analysis and evidenced-based data, I still wonder at the resources being applied to some "green" research projects.

For instance, did we really need a team from the University of Queensland and the University of Canterbury to apply predictive models, together with advanced mapping techniques, to determine the climate damage caused by wild pigs on five continents?

The recent publication of their findings made for fantastic "colour" pieces across all media formats but really, to what productive end-use? Surely their findings only confirm what we already know … when soil is turned over by man, machine or animal, it releases carbon into the air.

Methinks this is a case of swine before pearls, rather than the other way around.

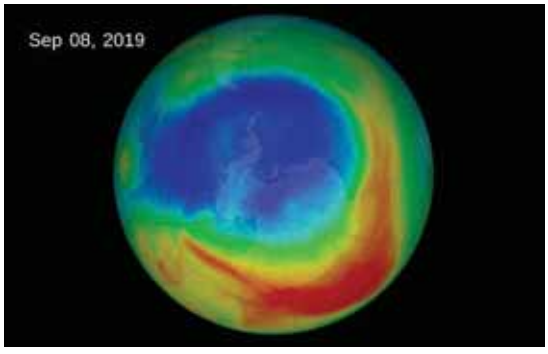
CIBSE action plan

The second revision of the CIBSE Climate Action Plan has now been published and includes many important updates on CPD, new and upcoming guidance, energy benchmarks, a new embodied carbon award, and much more.

This is an invaluable aid for consulting engineers when designing indoor environment solutions that need to meet all present and anticipated best practice, along with regulations and standards compliance.

Ozone layer good news

While there is no denying the catastrophic consequences of global warming, a recent report says that, thanks to the Montreal Protocol Agreement of 1987 that banned CFCs, the subsequent recovery in the ozone layer has saved 2.5ºC of warming.



Computer models show that there would have been 580 billion tonnes less carbon stored in forests, vegetation and soils by 2100 without the treaty. No harm rejoicing in a win, even if it is a small one.

Boil a kettle with fusion energy …

Scientists in California have successfully demonstrated "fusion ignition" for the first time, something that has been

hailed as "a phenomenal breakthrough". Unlike fission, the reaction used in nuclear power plants, nuclear fusion is the process that powers the sun and involves joining rather than splitting atoms, so there is little or no radioactive waste.

However, it is still very early days. Apparently, the $10 billion experiment released only enough energy to boil a kettle! Still, we have to start somewhere I guess.

ALPHA1 L & GO Replace

BETTER HEATING SYSTEMS

FOR THE HOME

ALPHA1 L

Thanks to its compact design, simple connection to signal cables (PWM), and tolerance for higher ambient temperatures, ALPHA1 L fits in the majority of heating installations equipped with Grundfos pumps.
To make choosing the right pump model and installing the new pump even easier Grundfos have developed the GO Replace app.

Key benefits

- Compatible with most Grundfos circulators running in heating installations
- Reduces the need to carry excess spares
- Replace complete pump or just the pump head
- Connection for signal cables (PWM)
- Durable construction and high quality materials

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01 408 9800

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be
think
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